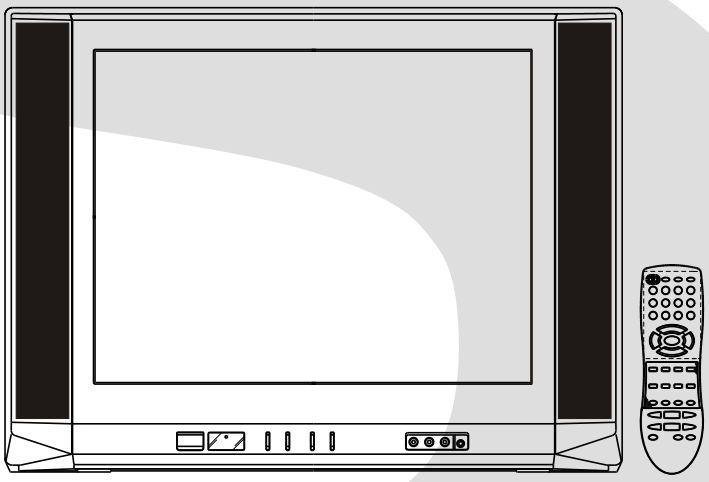
TOSHIBA

FILE NO.050-200101

SERVICE MANUAL

COLOR TELEVISION

20AF41



DOCUMENT CREATED IN JAPAN, DEC., 2001

SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.
Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a ⚠ mark, the designated parts must be used.

4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.
Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.
Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

(INSULATION CHECK PROCEDURE)

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the eternal exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note1]** .
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

[Note 1]

If you have not the 500V insulation resistance meter, use a Tester.

[Note 2]

External exposure metal: Antenna terminal
Earphone jack

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the VERSION LETTER.)

1. MODEL NUMBER and VERSION LETTER
   The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.
2. PART NO. and DESCRIPTION
   You can find it in your SERVICE MANUAL.

IMPORTANT

Inferior silicon grease can damage IC's and transistors.
When replacing an IC's or transistors, use only specified silicon grease (YG6260M).
Remove all old silicon before applying new silicon.

GENERAL SPECIFICATIONS

G-1.Outline of the Product

20 inch(508.0 mmV):Measured diagonally

Color CRT 90 degree deflection

G-2.Broadcasting System

US System M

G-3.Color System ☒NTSC ☐PAL ☐SECAM or Monochrome signal

G-4.NTSC Playback(PAL 60Hz) ☐Yes ☒No

G-5.NTSC 3.58+4.43/PAL60Hz ☐Yes ☒No

G-6.Antenna Input Impedance

VHF/UHF 75 ohm unbalanced

G-7.Tuner and Receiving Contactless Electric tuner ☒1Tuner System ☐2Tuner System

channel Tuner ☐Oscar(W/O HYPER) ☐Oscar(W/ HYPER) ☐France CATV) ☒Others

channel coverage

(USA) 2~69 , 4A , A-5~A-1, A~I , J~W, W+1~W+84

Tuning System

☒Frequency syn. ☐Voltage syn. ☐Others

G-8.Preset Channel

-- channels

G-9.Intermediate Frequency

Picture(fP)	45.75 MHz	_____ MHz	_____ MHz
Sound (fS)	41.25 MHz	_____ MHz	_____ MHz
fP-fS	4.50 MHz	_____ MHz	_____ MHz

G-10.Stereo/Dual TV Sound

☒ Yes(☐NICAM ☐GERMAN ☒USA ☐JAPAN) ☐No

G-11.Tuner Sound Muting ☒Yes ☐No

G-12.Power Source 120 V ☐AC 50Hz ☒AC 60Hz

G-13.Power Consumption: 105 W at AC 120 V 60 Hz

- W at DC _____V

Stand by: 4 W at AC 120 V 60 Hz

Per Year: _____kWh / Year

G-14.Dimensions(Approx.)

590 mm(W) 487.5 mm(D) 444 mm(H)

G-15.Weight(Approx.) Net : 23 kg (50.6 lbs)

Gross: 26.5 kg (58.3 lbs)

G-16.Cabinet Material

Cabinet Front:	☒PS	☐94HB	☒DECABROM
	☐ABS	☐94V2	☐NON-DECA
		☒94V0	
Back Panel:	☒PS	☐94HB	☒DECABROM
	☐ABS	☐94V2	☐NON-DECA
		☒94V0	

G-17.Protector: ☒Power Fuse

GENERAL SPECIFICATIONS

G-18.Regulation

Safety

☐UL	☒CSA	☐SAA	☐SI	☐CE	☐SEV
☐BS	☐NF	☐NEMKO	☐FEMKO	☐DEMKO	☐IEC65
☐SEMKO	☐NZ	☐HOMOLO	☐SABS	☐CNS	☐SISIR
☐NOM	☐AS3159	☐DENTORI	☐UNE	☐GOST	☐NONE

Radiation

☐FCC	☒DOC	☐FTZ	☐PTT	☐CE	☐SEV
☐SABA	☐SI	☐NF	☐NZ	☐HOMOLO	☐UNE
☐CNS	☐CISPR13	☐DENTORI	☒AS/NZS	☐NONE	

X-Radiation

☐PTB	☐DHHS	☒HWC	☐DENTORI	☐NONE

G-19.Temperature

Operation 5 ºC~ 40 ºC

Storage -20 ºC~ 60 ºC

G-20.Operating Humidity Less than 80 %RH

G-21.Clock and Timer

Sleep Timer	☒Yes Max 120 Min.(10 Min. Step)	☐No
On/Off Timer	☐Yes _____ Programs	☒No
Wake Up Timer	☐Yes _____ Programs	☒No

G-22.Timer back up Time

More than -- Minutes (at Power Off Mode)

G-23.Terminals

☒VHF/UHF Antenna	☐ Din Type ☒ F-Type	☐ France Type
☒Video Input(Front)	(RCA ø8.3x1)	
☒Video Input(Rear1)	(RCA ø8.3x1)	
☒Video Input(Rear2)	(RCA ø8.3x1)	
☒Video Output(Rear)	(RCA ø8.3x1)	
☒Audio Input(Front)	(RCA ø8.3x2)	
☒Audio Input(Rear1)	(RCA ø8.3x2)	
☒Audio Input(Rear2)	(RCA ø8.3x2)	
☒Audio Output(Rear)	(RCA ø8.3x2)	
☐21 Pin (x___)	☐DC Jack(Center +)	☐Ear Phone Jack(ø3.5)
☒Head Phone Jack(ø3.5)	☐AC Outlet	☐Ext Speaker
☐Diversity	☐S Input(Front)	☒S Input(Rear)
☒Color Streem	(RCA ø8.3x3)	

G-24.Indicator

☒Power	☐Stand By	☐On Timer	☐NONE
(RED)	(____)	(_____)	

G-25.Display

On Screen Display

☒Menu (Windows Type/Picture Menu)

- ☒Picture
  - ☒Contrast ☒Brightness ☒Color ☒Tint ☒Sharpness
- ☒SOUND
  - ☒Bass ☒Treble ☒Balance
  - ☒BBE ON/OFF ☒Stable Sound ON/OFF
- ☒SETUP
  - ☒TV/CATV ☒CH Prpgram ☒Add/Erase
- ☒OPTION
  - ☒Language ☒CH Label ☒Favorite CH
  - ☐V-CHIP ☒Color Streem DVD/DTV

☒Control Level ☒Sound ☒Brightness ☒Contrast ☒Color ☒Tint(NTSC Only) ☒Sharpness ☐Tuning ☒Bass ☒Treble ☒Balance ☐Back Light

☒Stereo,Audio Output,SAP ☒Video ☒ColorStream

☒Channel ☒CH Label ☒Sleep Timer ☒Sound Mute

☐V-Chip Rating

GENERAL SPECIFICATIONS

G-26.OSD Language

☒Eng ☐Ger ☒Fre ☒Spa ☐Ita ☐Por ☐Jpn

OSD Language Setting

☒Eng ☐Ger ☐Fre ☐Spa ☐Ita ☐Por ☐Jpn

☐Not Applicable

G-27.Speaker

Position ☒Front ☐Side ☐Bottom

Size 2x4.7 inches

Imp 8 ohm x 2 pcs

Power Max 2.5 + 2.5 W

10% 2.0 + 2.0 W (Typical)

G-28.EXT Speaker

☐Yes - W Imp - ohm ☒NO

G-29.Carton

Master Carton: ☐Need ☒No Need

Content: ---- Set

Material: ---- / ---- Corrugated Carton

Dimensions: ---- mm(W) ---- mm(D) ---- mm(H)

Description of Origin ☐Yes ☐No

Gift Box

Material ☒ Double/Brown Corrugated Carton (☐with Photo Label)

☐ Double/White Corrugated Carton (☐with Photo Label)

☐ Double Full Color Carton W/Photo

Dimensions: 658 mm(W) 575 mm(D) 529 mm(H)

Design: As Per BUYER 's

Description of Origin: ☒Yes ☐No

Drop Test Natural Dropping At 1 Corner / 3 Edges / 6 Surfaces

Height ☐25cm ☐31cm ☒46cm ☐62cm ☐80cm

Container Stuffing: 288 Sets / 40' container

G-30.Accessories

☒Owner's Manual (☒W/Warranty) [English/French]

☐Channel Film

☐AC Plug Adapter ☒Remote Control Unit

☒Battery (UM- 4 x 2)

☐Safety Tip ☐Toll Free Insert Sheet

☐Guarantee Card ☐Audio-Video Cord (RCA)

☒Registration/Warranty Card ☐Warning Sheet

☐Quick Set-Up Sheet ☐Schematic Diagram

☐Information Sheet ☐U/V Mixer

☐75 ohm Coaxial Cable (☐Single Shield ☐Double Shield)

☐300 ohm to 75 ohm Antenna Plug

☐21pin Cable ☐Car Cord

☐Rod Antenna

☐One Pole ☐Two Pole (☐F-Type ☐Din Type ☐France Type)

☐Loop Antenna (☐F-Type ☐Din Type ☐France Type)

☒Important Safety Instructions ☒Service Station List

☒Envelope

GENERAL SPECIFICATIONS

G-31.Other Features

☒Auto Degauss	☐Auto Search	☐Full OSD
☒Auto Shut Off	☐CH Allocation	☐Premiere
☐Canal+	☒SAP	☒Comb Filter(3LINE)
☒CATV	☐Channel Lock	☒Auto CH Memory
☐Anti-Theft	☐Just Clock Function	☐Hotel Lock
☐Rental	☐Game Position	☒Closed Caption
☒Memory (☒Last CH ☒Last Vol.)		☒Stable Sound
☐V-Chip(Toshiba Type)	☒CH LAVEL	☒Favorite CH
☒BBE	☒VM Circuit	

G-32.Switch

Front

☒Power(Tact)	☒Channel Up	☒Volume Up
☐System Select	☒Channel Down	☒Volume Down
☐Main Power SW	☐Sub Power	

Rear

☐AC/DC	☐TV/CATV Selector
☐Degauss	☐Main Power SW

G-33.Magnetic Field

☒BV : +0.45G	☐BV : +0.35G	☐BV : +0.25G
BH : 0.18G	BH : 0.30G	BH : 0.30G
☐BV : -0.15G	☐BV : -0.25G	☐BV : -0.50G
BH : 0.15G	BH : 0.15G	BH : 0.30G

G-34.Remote Control Unit: RC-DU

Glow in Dark Remocon ☒Yes ☐No

Power Source: D.C 3 V Battery UM - 4 x 2

Total 42 Key

☒ Power		
☒ 0	☒Muting	☒TV/Video(TV/AV)
☒ 1	☒TV/Caption/Text	☒Volume Up
☒ 2	☒CH1/CH2	☒Volume Down
☒ 3	☒Sleep	☒MTS(Audio Select)
☒ 4	☒RE Call(Call)	☒CH Down
☒ 5	☒Reset	☒CH Up
☒ 6	☒Menu/Enter	☒FAV. UP
☒ 7	☒EXIT	☒FAV. DOWN
☒ 8	☒CH RTN/CH ENT(Quick View)	
☒ 9		
☒100		

Multi Brand Key

☒CH Up(VCR)	☒FF	☒TV
☒CH Down(VCR)	☒Rec	☒VCR
☒Pause/Still	☒Stop	☒Cable
☒TV/VCR(VCR)	☒Rew	☒Play
☒CODE		

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF ANODE CAP

Read the following **NOTED** items before starting work.

* After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
* Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

REMOVAL

1. Follow the steps as follows to discharge the Anode Cap. **(Refer to Fig. 1-1.)**
   Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground.
   While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver.
   A cracking noise will be heard as the voltage is discharged.

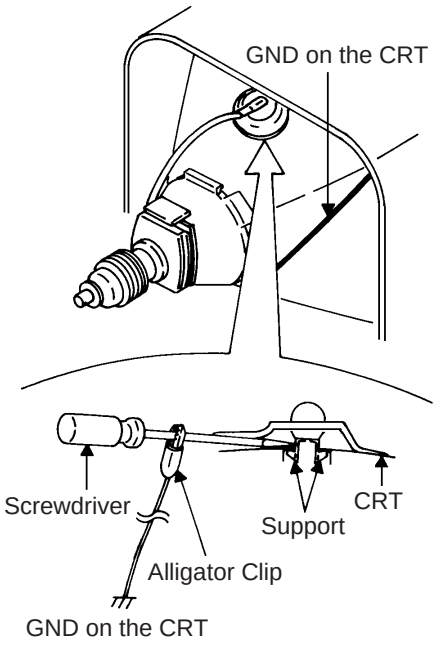


Fig. 1-1

2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support. **(Refer to Fig. 1-2.)**

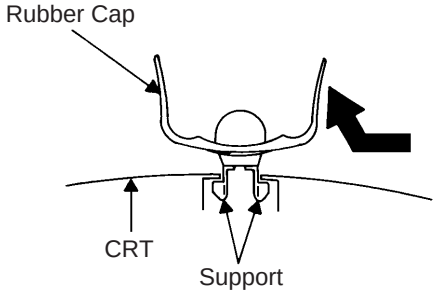


Fig. 1-2

3. After one side is removed, pull in the opposite direction to remove the other.

NOTE

Take care not to damage the Rubber Cap.

INSTALLATION

1. Clean the spot where the cap was located with a small amount of alcohol. **(Refer to Fig. 1-3.)**

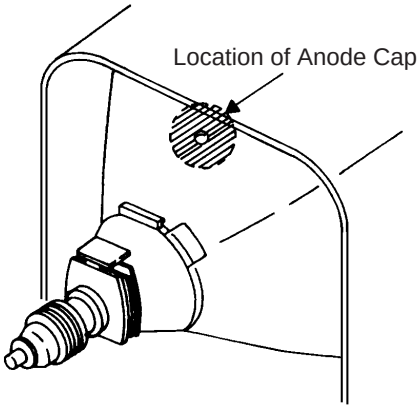


Fig. 1-3

NOTE

Confirm that there is no dirt, dust, etc. at the spot where the cap was located.

2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. **(Refer to Fig. 1-4.)**

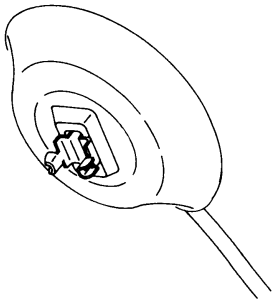


Fig. 1-4

4. Insert one end of the Anode Support into the anode button, then the other as shown in **Fig. 1-5**.

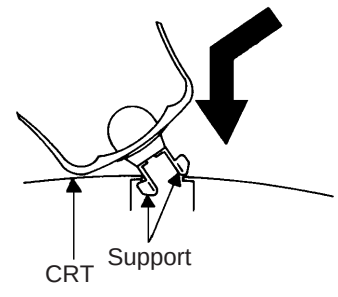


Fig. 1-5

5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

SERVICE MODE LIST

This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily.
To enter the Service Mode, press both set key and remote control key for more than 1 second.

Set Key	Remocon Key	Operations
VOL. (-) MIN	0	Releasing of V-CHIP PASSWORD.
VOL. (-) MIN	1	Initialization of the factory. NOTE: Do not use this for the normal servicing.
VOL. (-) MIN	6	POWER ON total hours is displayed on the screen. Refer to the "CONFIRMATION OF USING HOURS". Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "NOTE FOR THE REPLACING OF MEMORY IC".
VOL. (-) MIN	8	Writing of EEPROM initial data. NOTE: Do not use this for the normal servicing.
VOL. (-) MIN	9	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).

CONFIRMATION OF USING HOURS

POWER ON total hours can be checked on the screen. Total hours are displayed in 16 system of notation.

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and Channel button **(6)** on the remote control for more than 1 second.
3. After the confirmation of using hours, turn off the power.

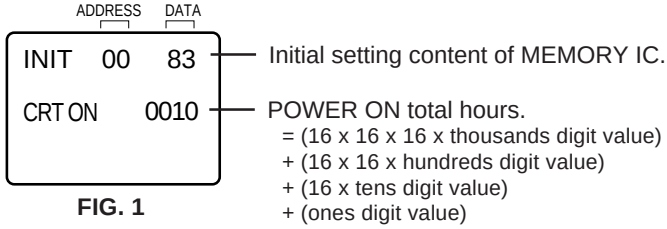


FIG. 1

NOTE FOR THE REPLACING OF MEMORY IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	A1	C3	CF	00	31	B3	27	37	BE	E8	F4	84	00	00	00	46
10	40	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 1

1. Enter DATA SET mode by setting VOLUME to minimum.
2. Press both VOL. DOWN button on the set and Channel button **(6)** on the remote control for more than 1 second. ADDRESS and DATA should appear as FIG 1.
3. ADDRESS is now selected and should "blink". Using the VOL. UP/DOWN button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using VOL. UP/DOWN button until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.

The unit will now have the correct DATA for the new MEMORY IC.

ELECTRICAL ADJUSTMENTS

1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
  Inferior silicon grease can damage IC's and transistors.
- When replacing IC's and transistors, use only specified silicon grease.
  Remove all old silicon before applying new silicon.

Prepare the following measurement tools for electrical adjustments.

1. Synchro Scope
2. Digital Voltmeter

On-Screen Display Adjustment

1. In the condition of NO indication on the screen. Press the VOL. DOWN button on the set and the Channel button **(9)** on the remote control for more than 1 second to appear the adjustment mode on the screen as shown in **Fig. 1-1**.

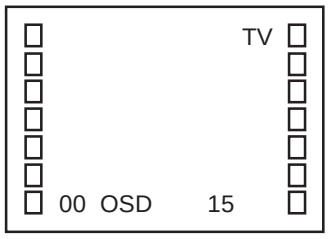


Fig. 1-1

2. Use the Channel UP/DOWN button or Channel button **(0-9)** on the remote control to select the options shown in **Fig. 1-2**.
3. Press the MENU button on the remote control to end the adjustments.

NO.	FUNCTION	NO.	FUNCTION
00	OSD H	17	SUBCONT
01	CUT OFF	18	UNI COL
02	RF. AGC	19	---
03	---	20	TINT
04	H. POSI	21	SHARP
05	V. POSI	22	RGB CONT
06	H. SIZE	23	PARABOLA
07	V. SIZE	24	TRAPEZIU
08	V. CENT	25	COR TOP
09	V. LIN	26	COR BTM
10	VS. CORR	27	V EHT
11	G. DRV	28	H EHT
12	B. DRV	29	FM. LVL
13	R. BIAS	30	LEVEL
14	G. BIAS	31	SEP1
15	B. BIAS	32	SEP2
16	BRI	33	T. STE

Fig. 1-2

2. BASIC ADJUSTMENTS

2-1: CONSTANT VOLTAGE

1. Set condition is AV MODE without signal.
2. Connect the digital voltmeter to **TP002**.
3. Adjust the **VR502** until the digital voltmeter is 111 ± 1V.

2-2: RF AGC

1. Receive a 70dB monoscope pattern.
2. Connect the digital voltmeter between the **TP001** and the **GND**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(02)** on the remote control to select "RF. AGC".
4. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is 1.95 ± 0.05V.

2-3: CUT OFF

1. Adjust the unit to the following settings.
   G. DRIVE=64, B. DRIVE=64, R. BIAS=32, G. BIAS=32, B. BIAS=32, BRIGHTNESS=70, UNI COLOR=64.
2. Place the set with Aging Test for more than 15 minutes.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "CUT OFF".
4. Adjust the **Screen Volume** until a dim raster is obtained.

2-4: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set with Aging Test for more than 10 minutes.
2. Receive the white 100% signal from the Pattern Generator.
3. Using the adjustment control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(13)** on the remote control to select "R. BIAS".
5. Using the VOL. UP/DOWN button on the remote control, adjust the R. BIAS.
6. Press the CH. UP/DOWN button on the remote control to select the "G. DRV", "B. DRV", "G. BIAS" or "B. BIAS".
7. Using the VOL. UP/DOWN button on the remote control, adjust the G. DRV, B. DRV, G. BIAS or B. BIAS.
8. Perform the above adjustments 6 and 7 until the white color is looked like a white.

2-5: FOCUS

1. Receive a 70dB monoscope pattern.
2. Turn the Focus Volume fully counterclockwise once.
3. Adjust the **Focus Volume** until picture is distinct.

2-6: HORIZONTAL POSITION

1. Receive the center cross signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(04)** on the remote control to select "H. POSI".
4. Press the VOL. UP/DOWN button on the remote control until the right and left screen size of the vertical line becomes the same.

ELECTRICAL ADJUSTMENTS

2-7: HORIZONTAL SIZE

NOTE: Adjust after performing adjustments in section 2-6.

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(06)** on the remote control to select "H. SIZE".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes 10 ± 2%.

2-8: VERTICAL POSITION

NOTE: Adjust after performing adjustments in section 2-7.

1. Receive the center cross signal from the Pattern Generator.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(05)** on the remote control to select "V. POSI".
3. Press the VOL. UP/DOWN button on the remote control until the horizontal line becomes fit to the notch of the shadow mask.

2-9: VERTICAL SIZE

NOTE: Adjust after performing adjustments in section 2-8.

1. Receive the crosshatch signal from the Pattern Generator.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(07)** on the remote control to select "V. SIZE".
3. Press the VOL. UP/DOWN button on the remote control until the rectangle on the center of the screen becomes square.
4. Receive a broadcast and check if the picture is normal.

2-10: PARABOLA

1. Receive the crosshatch signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(23)** on the remote control to select "PARABOLA".
4. Press the VOL. UP/DOWN button on the remote control until the right and left vertical lines are straight.

2-11: TRAPEZIUM

1. Receive the crosshatch signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(24)** on the remote control to select "TRAPEZIU".
4. Press the VOL. UP/DOWN button on the remote control until the both vertical lines of the screen become parallel.

2-12: CORNER CORR TOP

1. Receive the crosshatch signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(25)** on the remote control to select "COR TOP".
4. Press the VOL. UP/DOWN button on the remote control until the upper section of the both ends vertical lines are straight.

2-13: CORNER CORR BOTTOM

1. Receive the crosshatch signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(26)** on the remote control to select "COR BTM".
4. Press the VOL. UP/DOWN button on the remote control until the bottom section of the both ends vertical lines are straight.

2-14: OSD HORIZONTAL

1. Activate the adjustment mode display of **Fig. 1-1**.
2. Press the VOL. UP/DOWN button on the remote control until the difference of A and B becomes minimum. **(Refer to Fig. 2-1)**

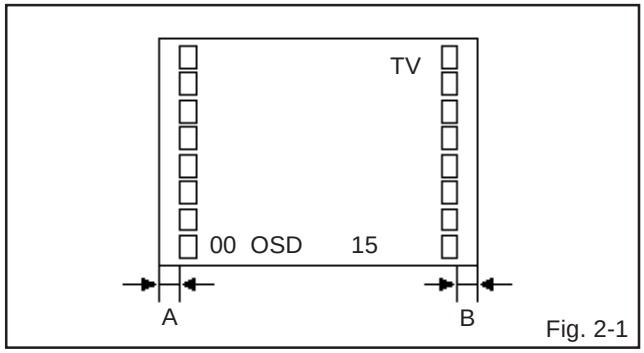


Fig. 2-1

2-15: LEVEL

1. Receive a 70dB monoscope pattern.
2. Connect the AC voltmeter to **TP901**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(30)** on the remote control to select "LEVEL".
4. Press the VOL. UP/DOWN button on the remote control until the AC voltmeter is 75 ± 2mV.

ELECTRICAL ADJUSTMENTS

2-16: SEPARATION 1, 2

1. Receive the stereo signal (L=2KHz, R=400Hz).
2. Connect the AC voltmeter to **AUDIO OUT JACK** though stereo filter (L=400Hz, R=2KHz).
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(31)** on the remote control to select "SEP1".
4. Press the VOL. UP/DOWN button on the remote control until the output of L-CH and R-CH become minimum.
5. Press the CH UP button once the set to "SEP2" mode.
6. Press the VOL. UP/DOWN button on the remote control until the output of L-CH and R-CH become minimum.
7. Press the CH DOWN button once the set to "SEP1" mode.
8. Repeat step 4 to step 7 several times.
   The output difference of the between with Filter and without Filter should be more than 25db for both L and R.

2-17: BRIGHTNESS

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(16)** on the remote control to select "BRI".
2. Press the VOL. UP/DOWN button on the remote control until the brightness step No. becomes "68"
3. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 1~2.
4. Press the TV/VIDEO button on the remote control to set to the CS mode. Then perform the above adjustments 1~2.

2-18: UNI-COLOR

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(18)** on the remote control to select "UNI COL".
2. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "8"
3. Press the TV/VIDEO button on the remote control to set to the AV mode.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(18)** on the remote control to select "UNI COL".
5. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "4"
6. Press the TV/VIDEO button on the remote control to set to the CS mode. Then perform the above adjustments 4~5.

2-19: SUB TINT/SUB COLOR

1. Receive the color bar pattern. (RF Input)
2. Connect the synchro scope to **TP806**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(20)** on the remote control to select "TINT".
4. Press the VOL. UP/DOWN button on the remote control until the waveform becomes as shown in **Fig. 2-2**.
5. Connect the synchro scope to **TP804**.
6. Press the CH DOWN button 3 times to set to "SUBCONT" mode.
7. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to 115% of the white level. **(Refer to Fig. 2-3)**
8. Receive the color bar pattern. (Audio Video Input)
9. Press the TV/VIDEO button on the remote control to set to the AV mode. Then perform the above adjustments 2~7.
10. Receive the color bar pattern. (Audio Video Input)
11. Press the TV/VIDEO button on the remote control to set to the CS mode. Then perform the above adjustments 2~6.
12. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to 140% of the white level. **(Refer to Fig. 2-4)**

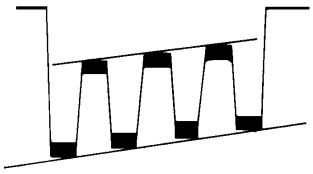


Fig. 2-2

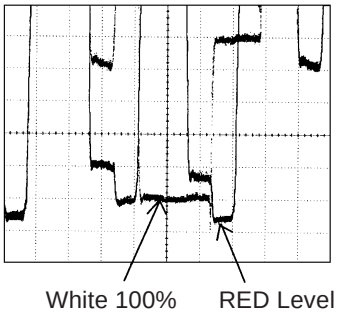


Fig. 2-3

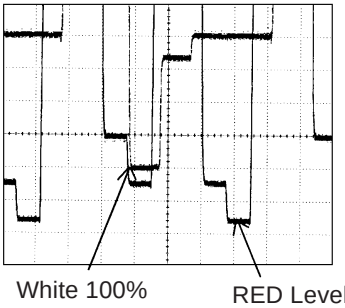


Fig. 2-4

ELECTRICAL ADJUSTMENTS

3. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 3-1)**
   If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

3-2: PURITY

NOTE

Adjust after performing adjustments in section 3-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.
   Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue colors.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

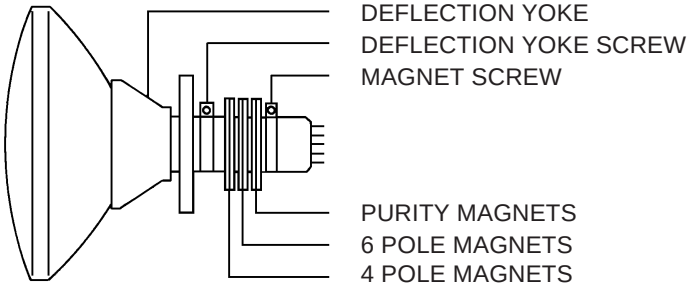


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

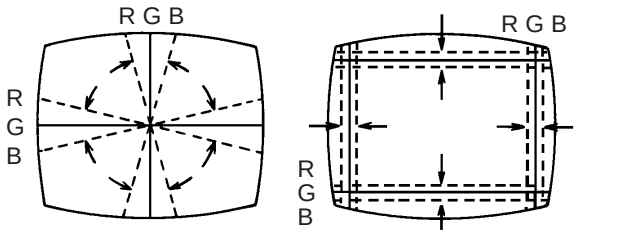
1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

3-4: DYNAMIC CONVERGENCE

NOTE

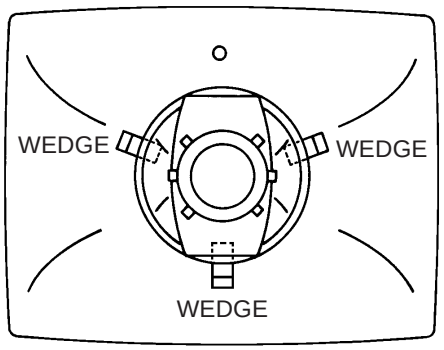
Adjust after performing adjustments in section 3-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left. **(Refer to Fig. 3-2-a)**
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke. **(Refer to Fig. 3-2-b)**



UPWARD/DOWNWARD SLANT RIGHT/LEFT SLANT

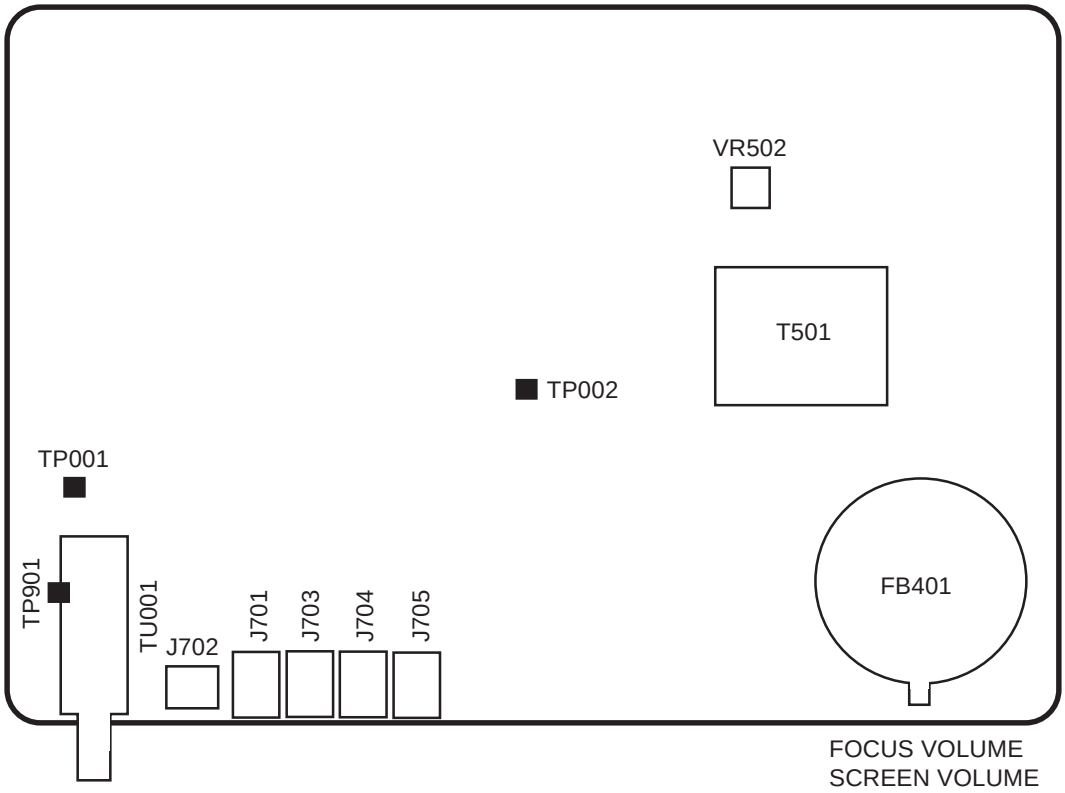
Fig. 3-2-a



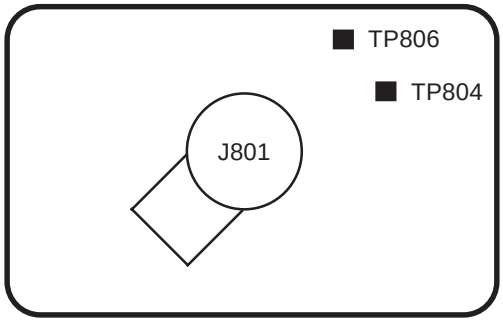
WEDGE POSITION

Fig. 3-2-b

MAJOR COMPONENTS LOCATION GUIDE

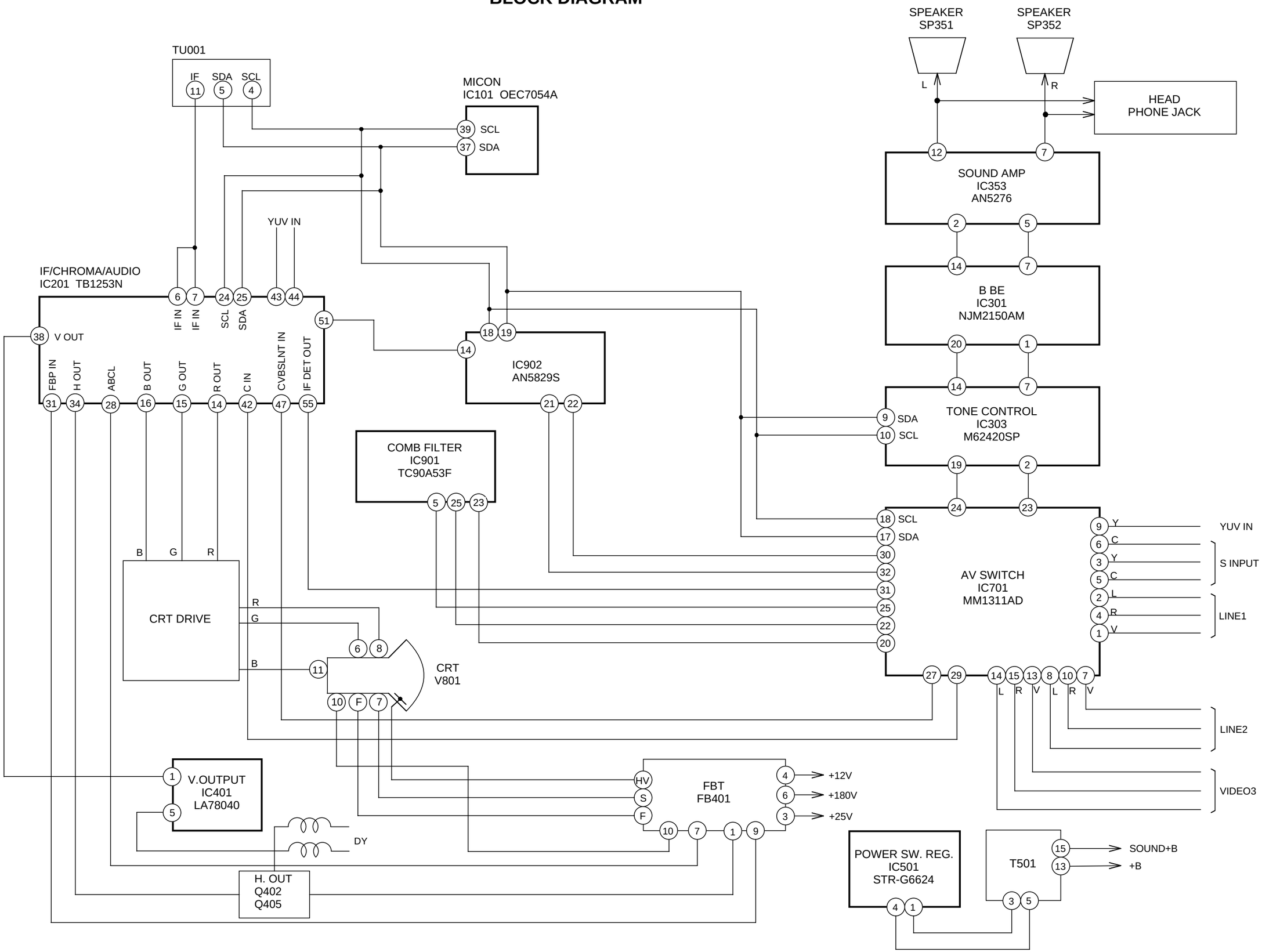


MAIN PCB

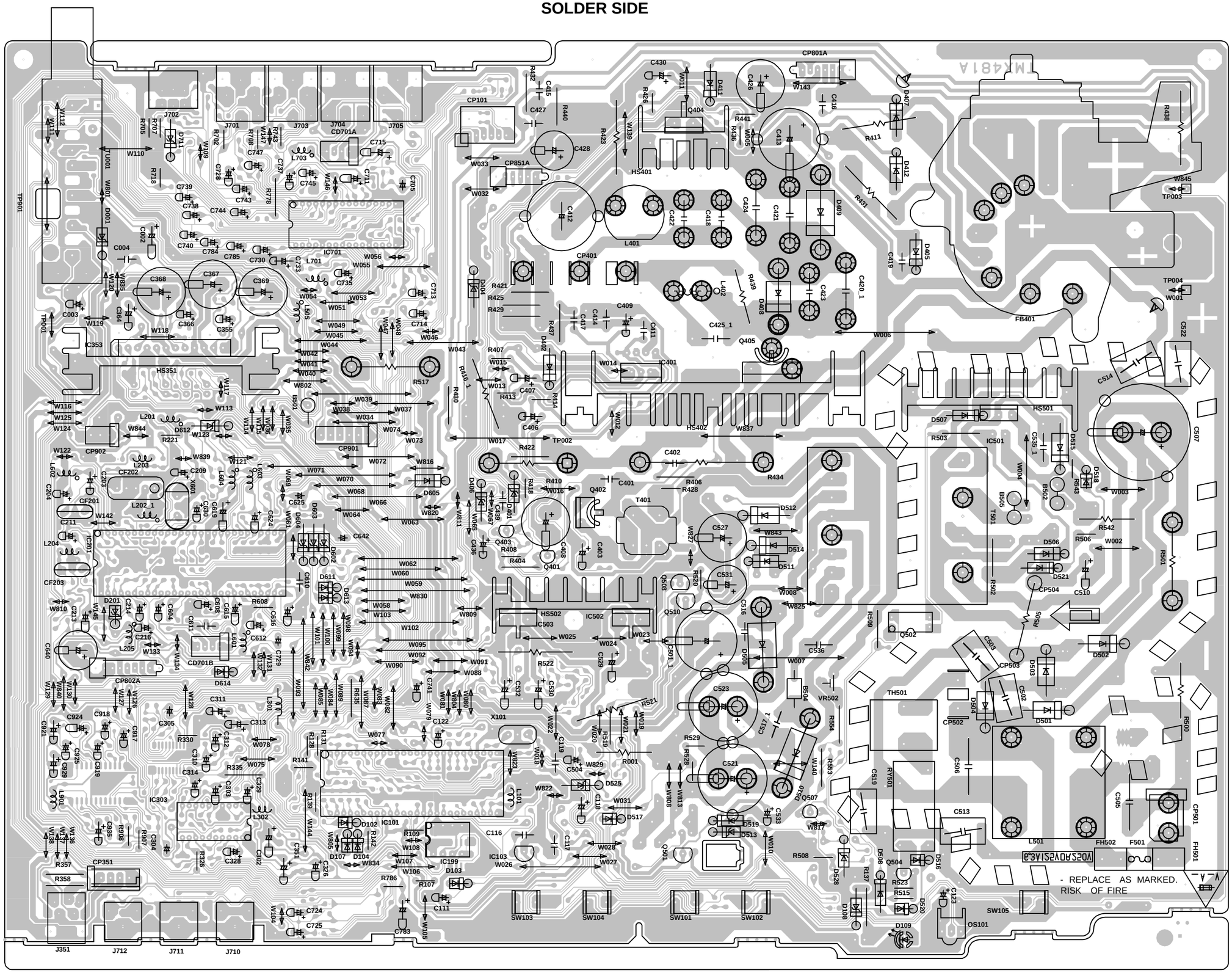


CRT PCB

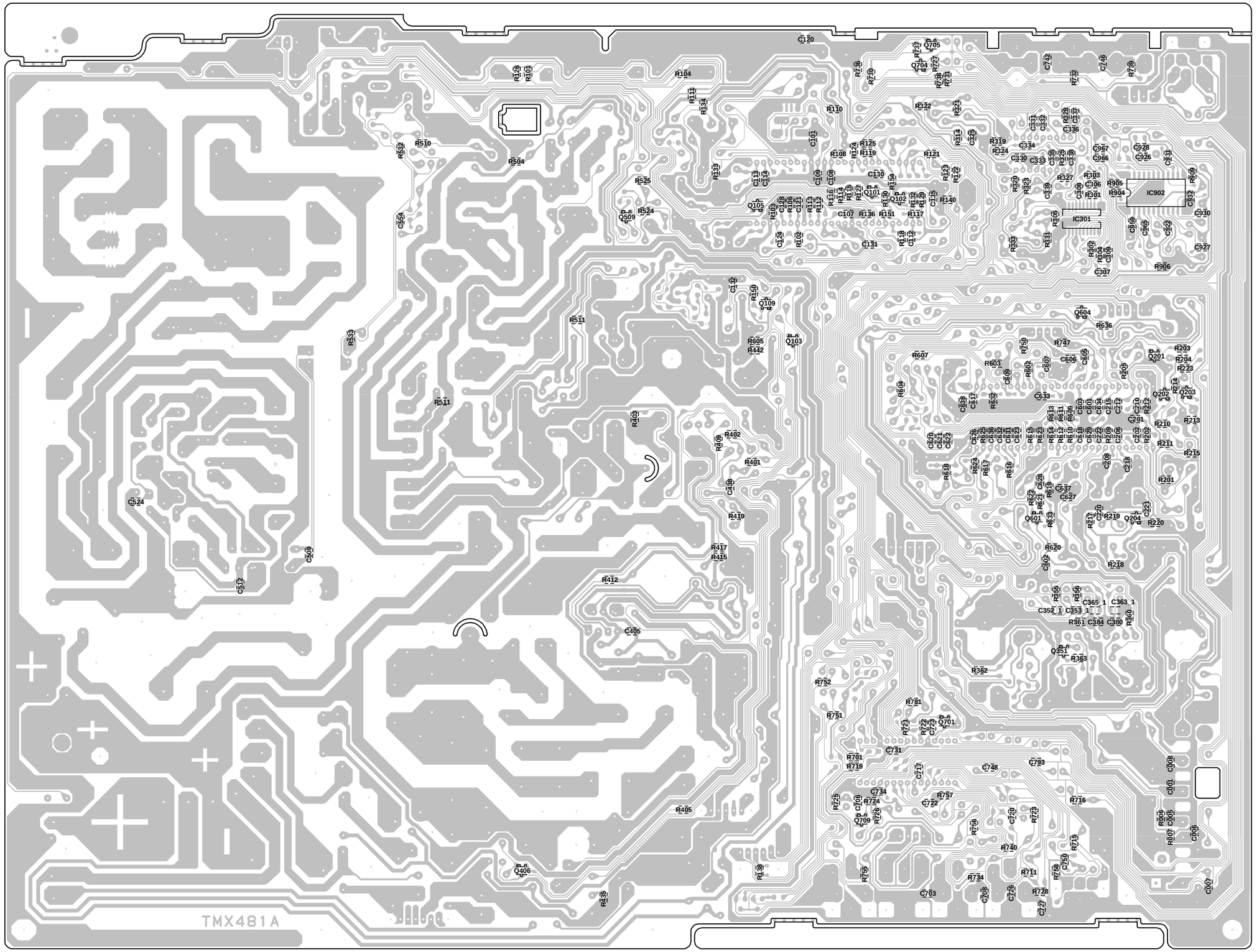
BLOCK DIAGRAM



PRINTED CIRCUIT BOARDS
MAIN (INSERTED PARTS)
SOLDER SIDE

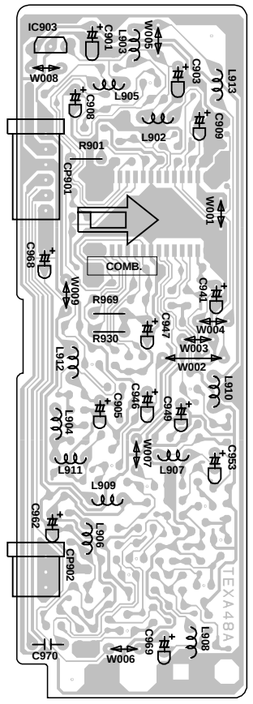


PRINTED CIRCUIT BOARDS
MAIN (CHIP MOUNTED PARTS)
SOLDER SIDE

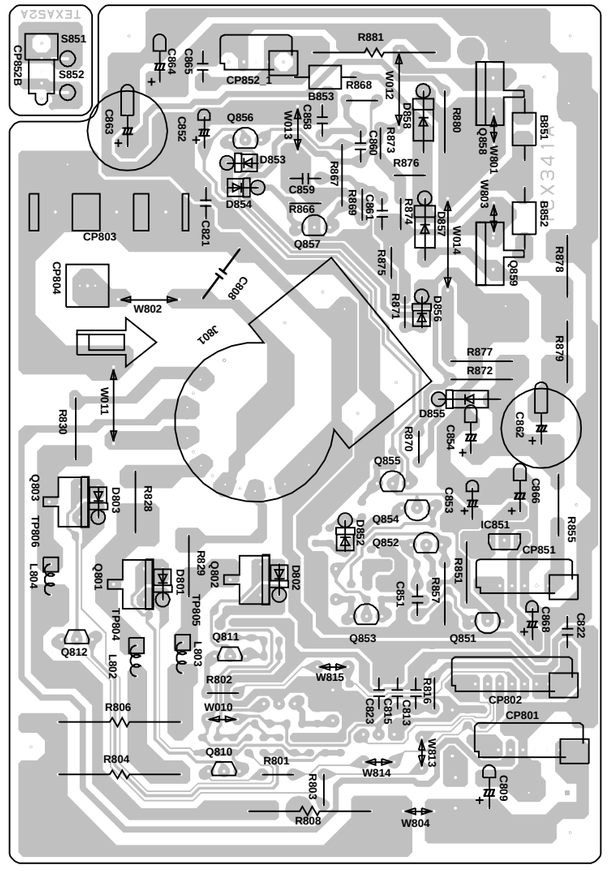


PRINTED CIRCUIT BOARDS

COMB FILTER (INSERTED PARTS)
SOLDER SIDE

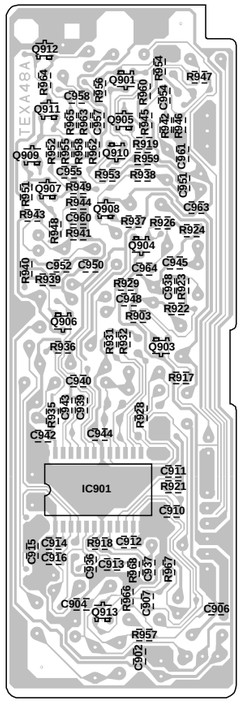


CRT/VM COIL (INSERTED PARTS)
SOLDER SIDE

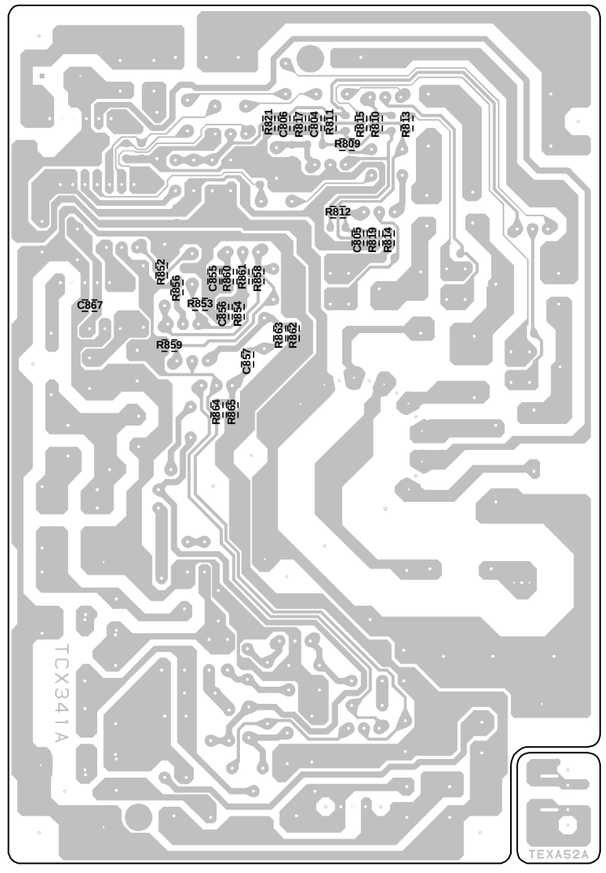


PRINTED CIRCUIT BOARDS

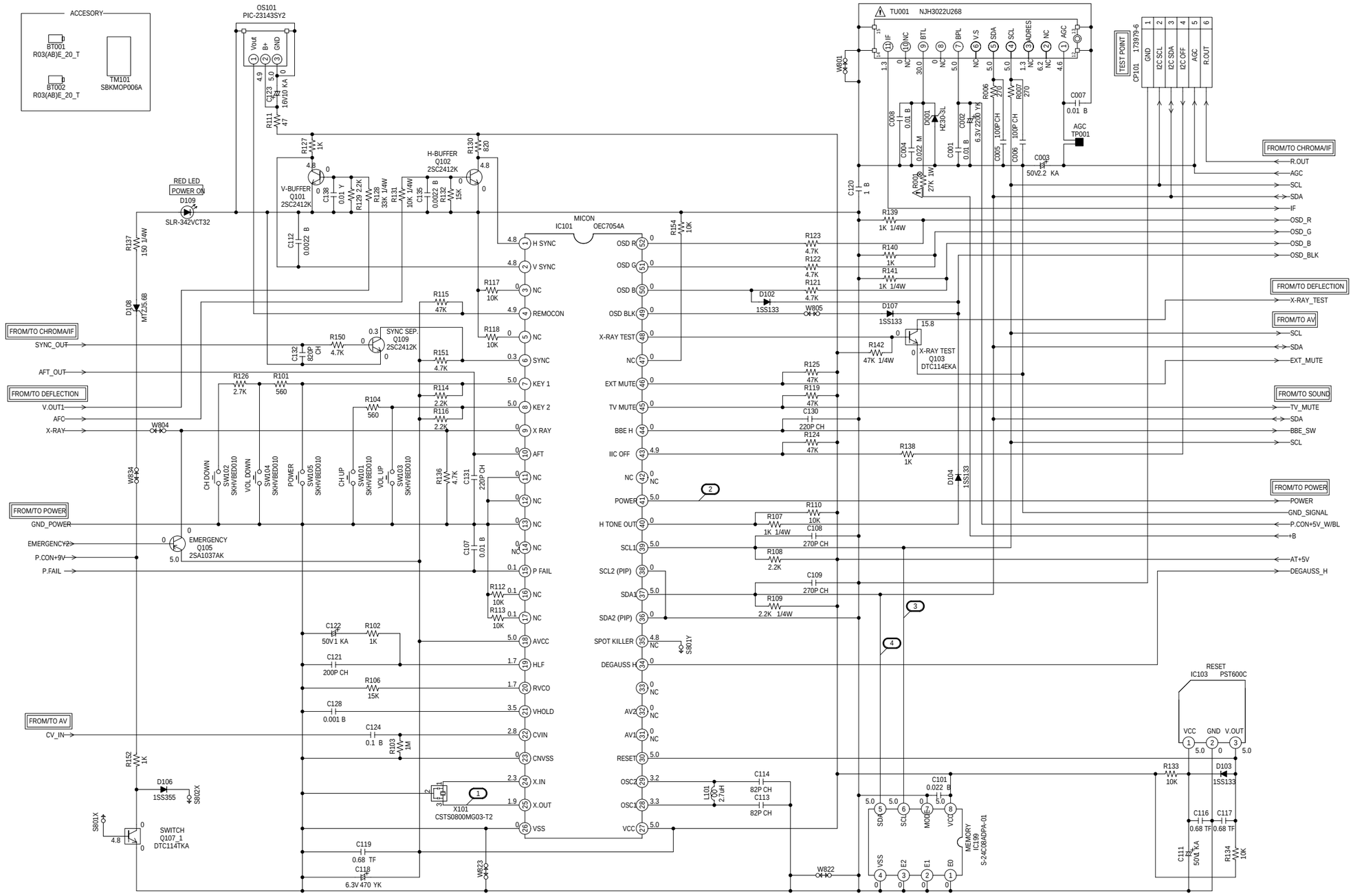
COMB FILTER (CHIP MOUNTED PARTS)
SOLDER SIDE



CRT (CHIP MOUNTED PARTS)
SOLDER SIDE



MICON / TUNER SCHEMATIC DIAGRAM (MAIN PCB)



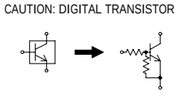
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

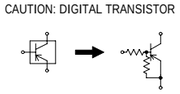
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

CAUTION: DIGITAL TRANSISTOR

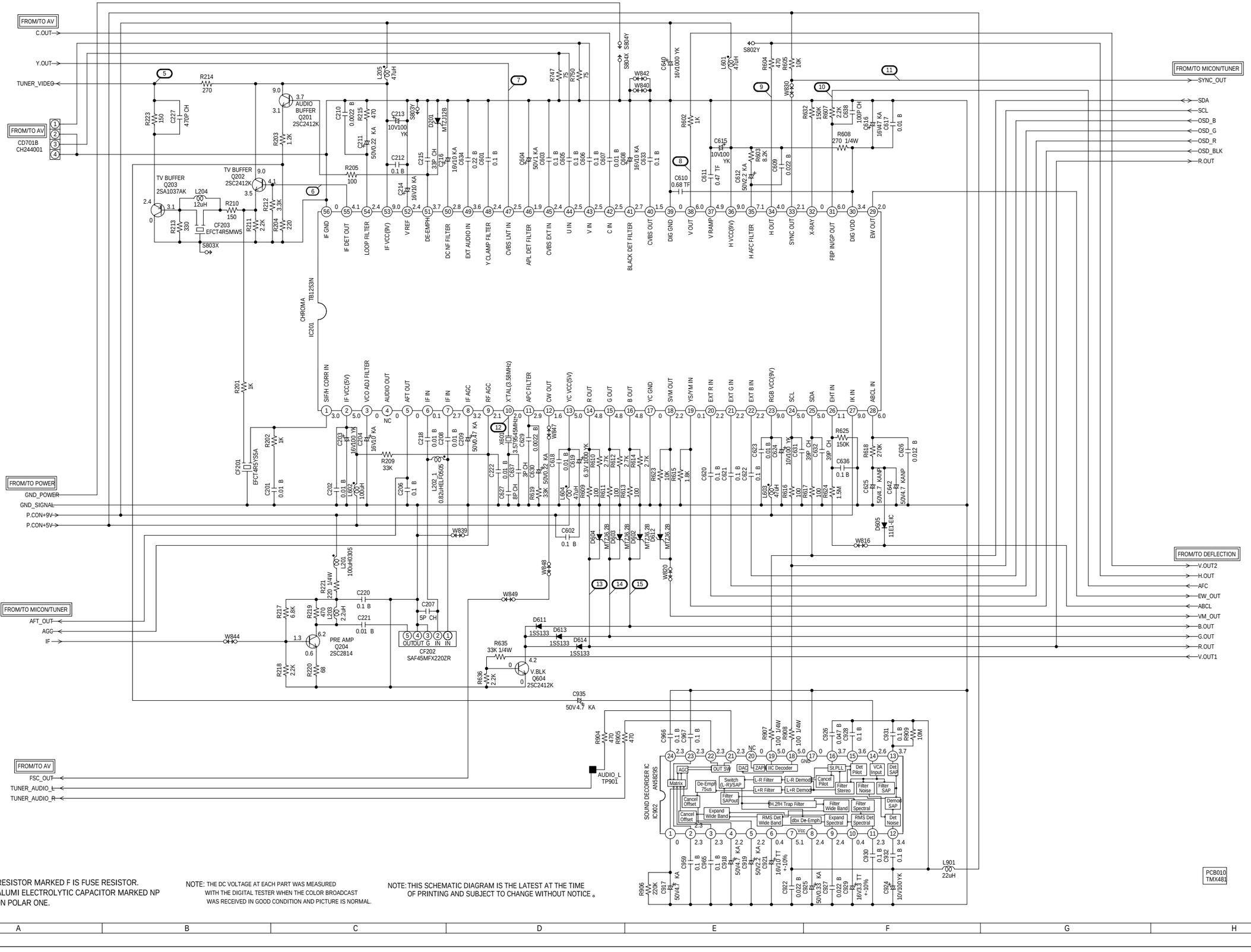


CAUTION: DIGITAL TRANSISTOR



PCB010
TMX481

CHROMA / IF SCHEMATIC DIAGRAM (MAIN PCB)

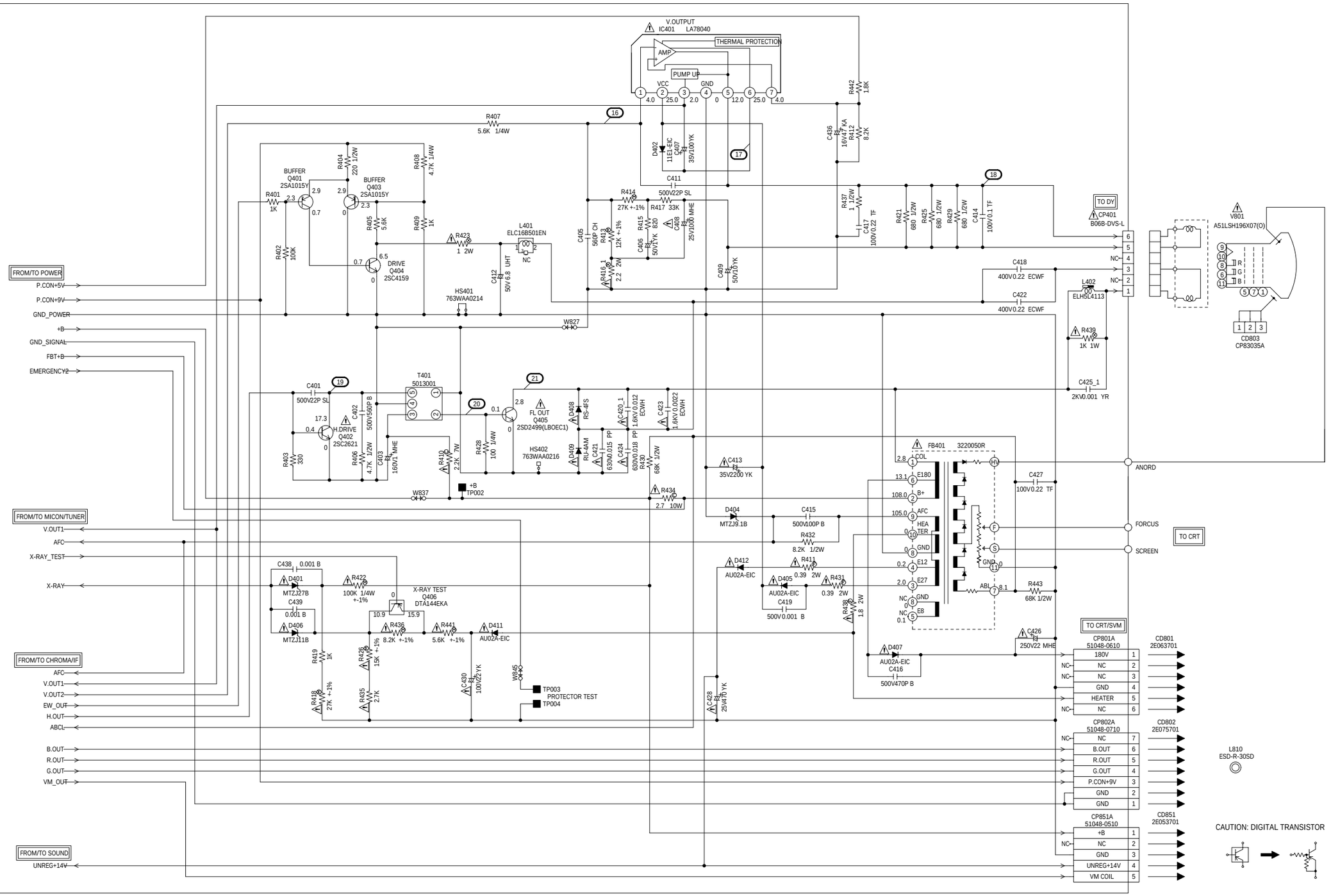


NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR.
THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP
IS NON POLAR ONE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED
WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST
WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

DEFLECTION SCHEMATIC DIAGRAM (MAIN PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

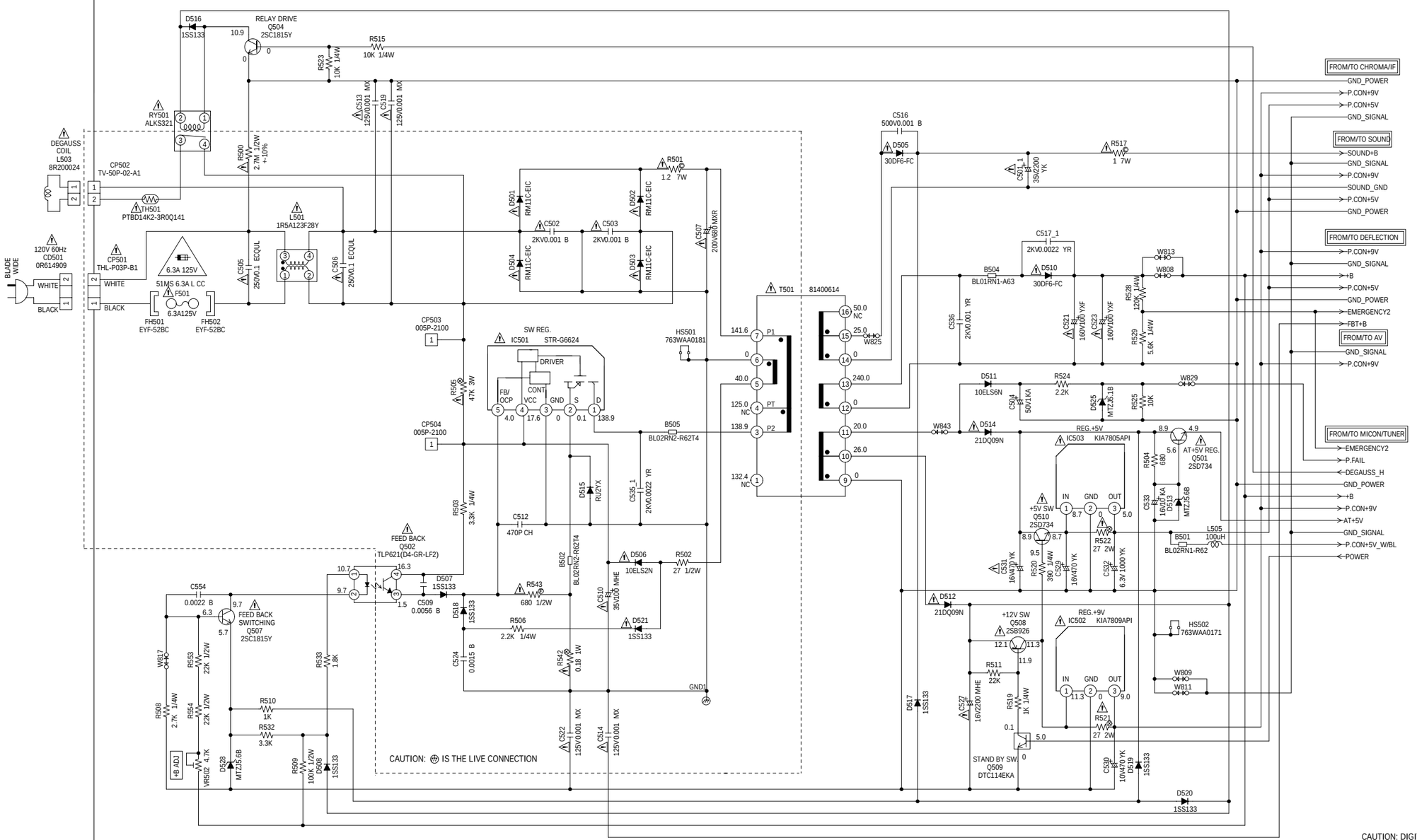
NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

POWER SCHEMATIC DIAGRAM (MAIN PCB)

6.3A 125V

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE FUSE 6.3A 125V(F501).

ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEIE
N'UTILISER QUE DES FUSIBLE DE MEME TYPE 6.3A 125V(F501).



CAUTION: DIGITAL TRANSISTOR

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

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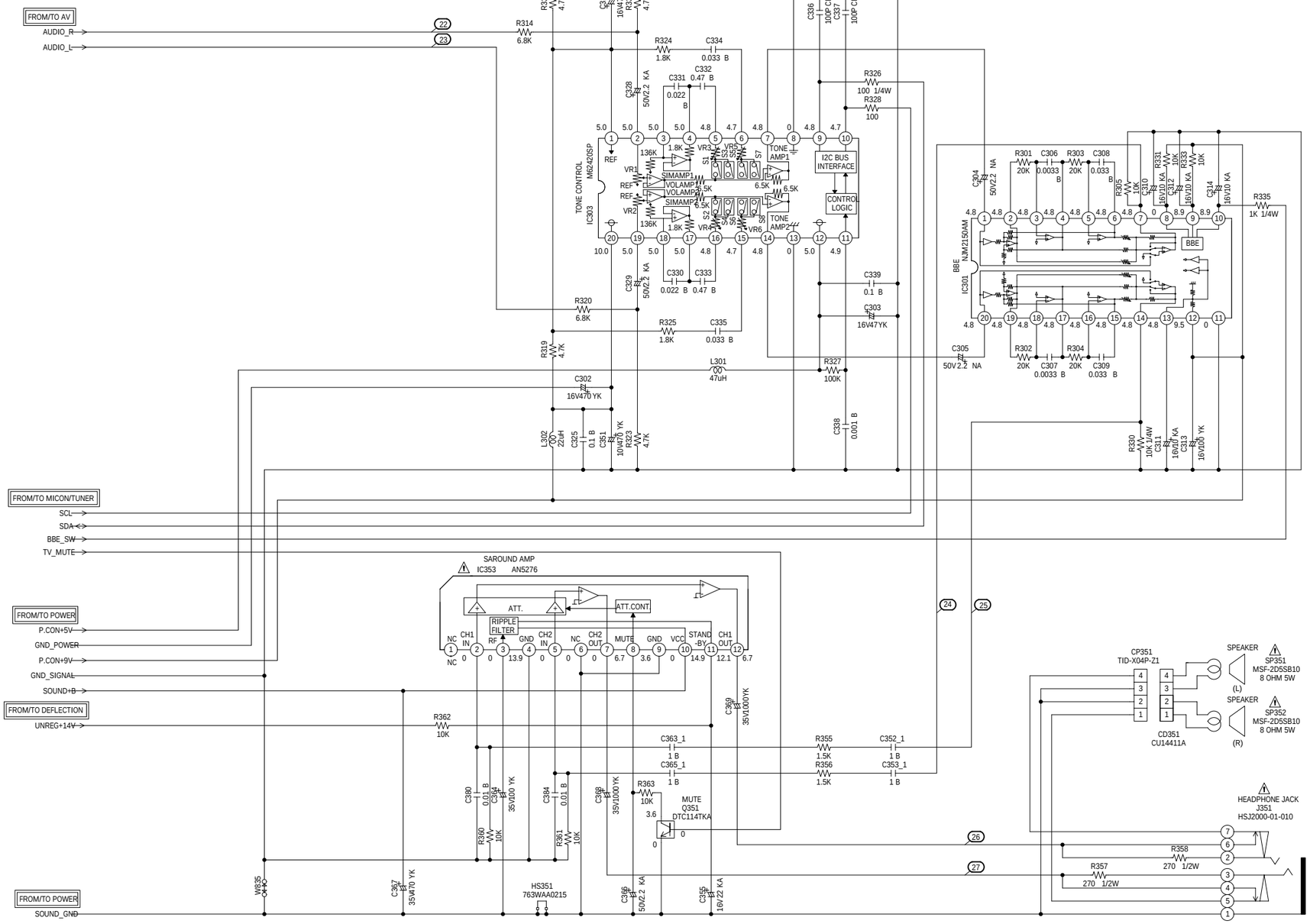
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR.
THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

PCB010
TMX481

SOUND SCHEMATIC DIAGRAM

(MAIN PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

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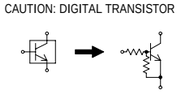
NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

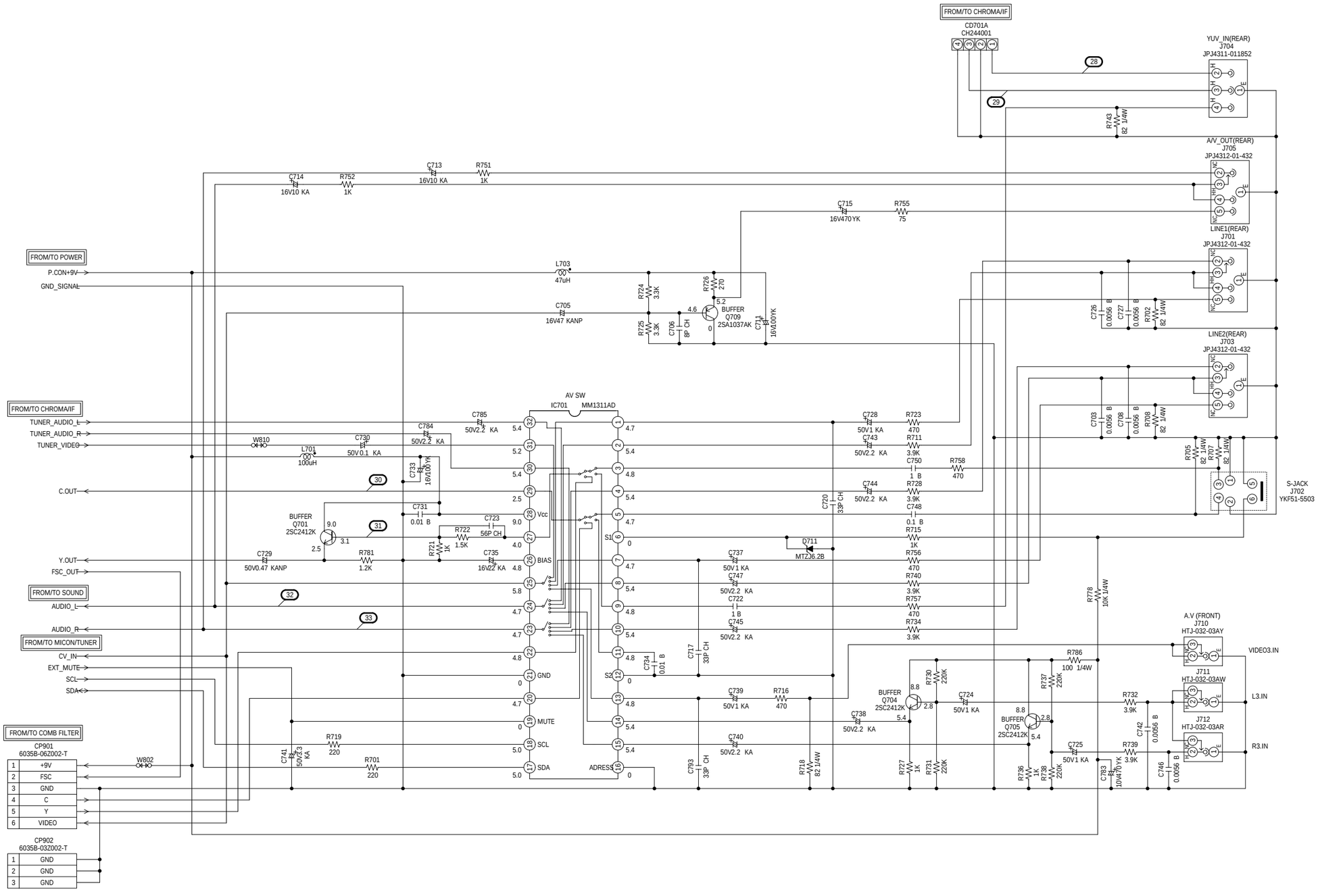
CAUTION: DIGITAL TRANSISTOR



PCB010
TMX481

AV SCHEMATIC DIAGRAM

(MAIN PCB)



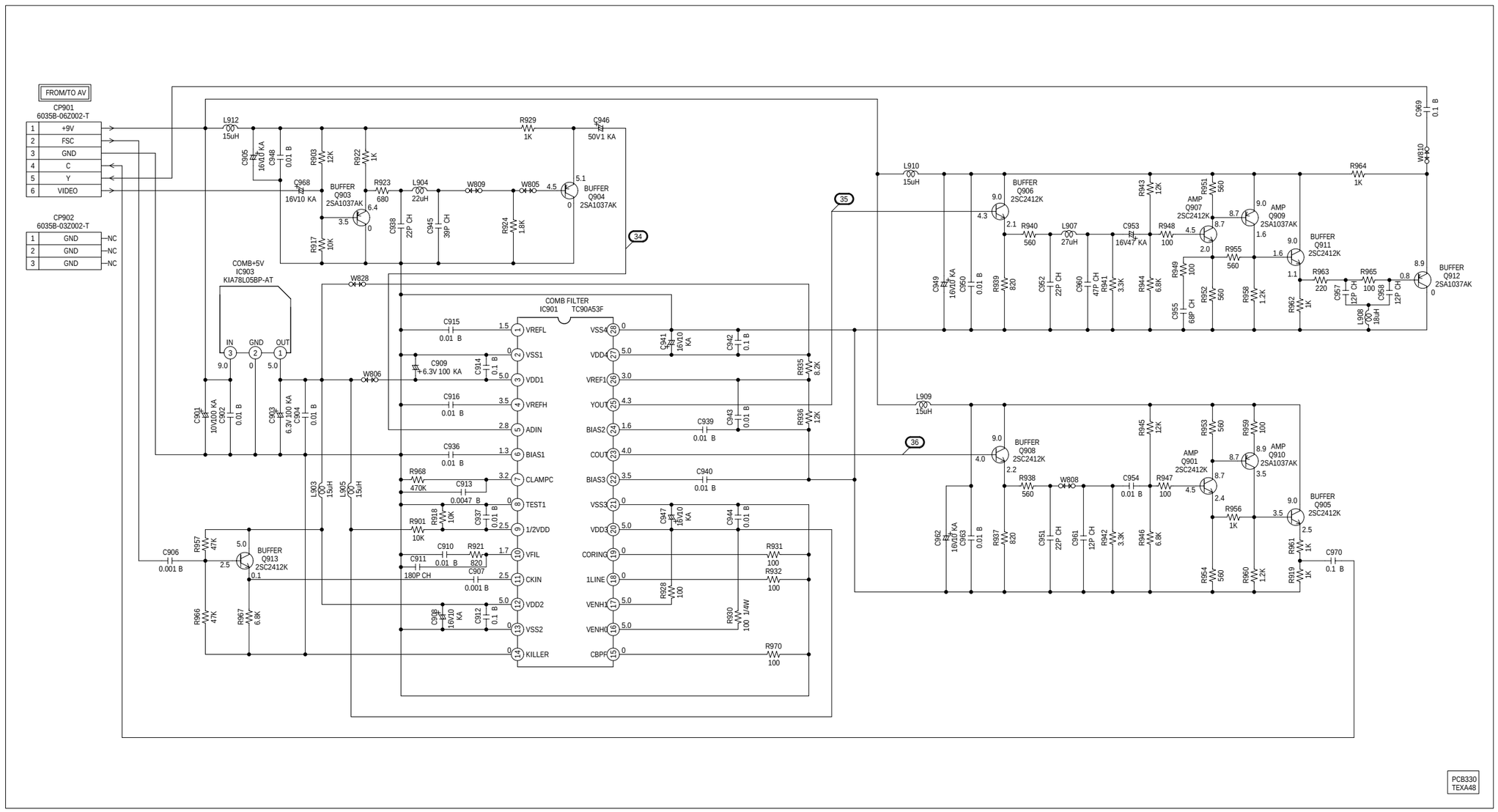
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

PCB010
TMX481

COMB FILTER SCHEMATIC DIAGRAM

(COMB FILTER PCB)



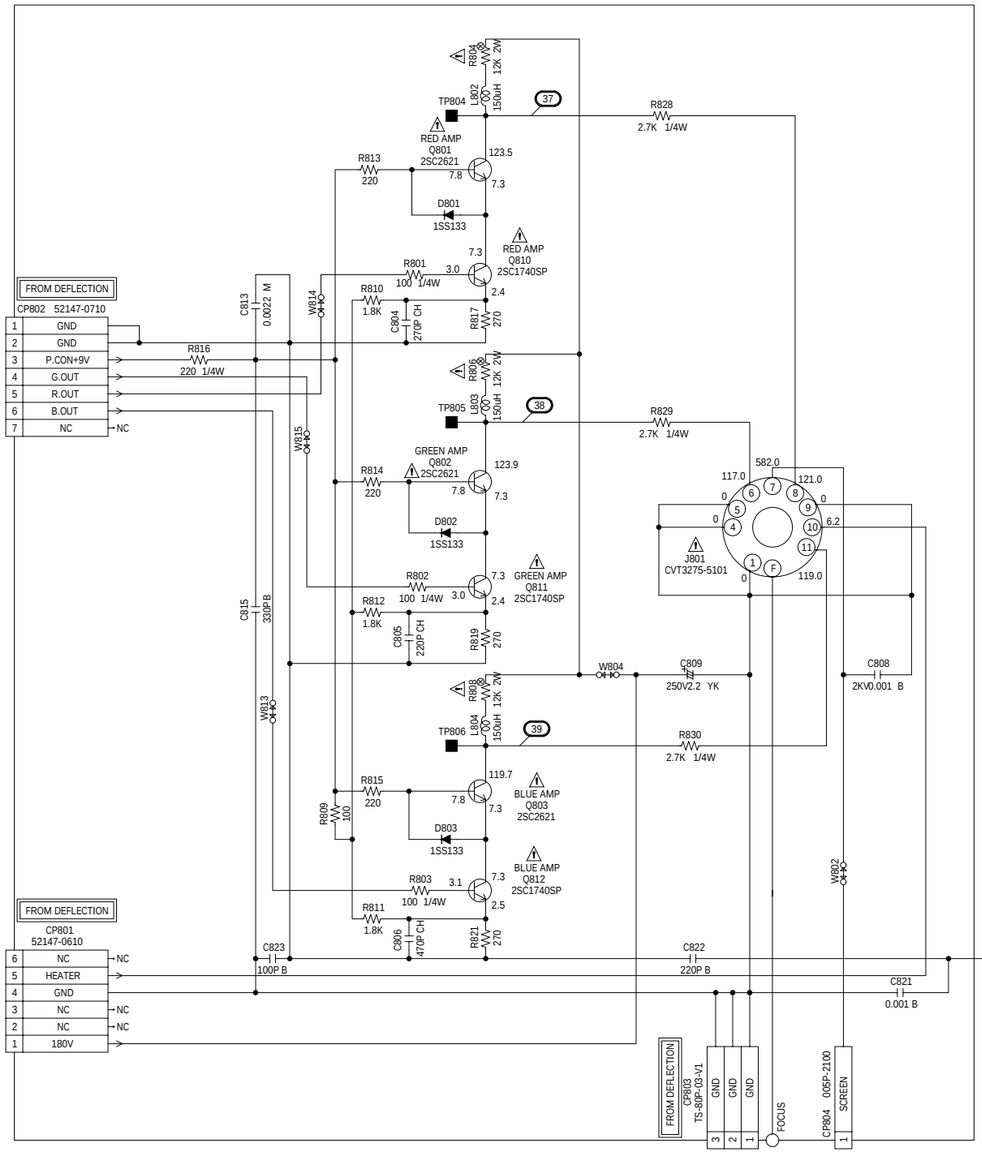
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

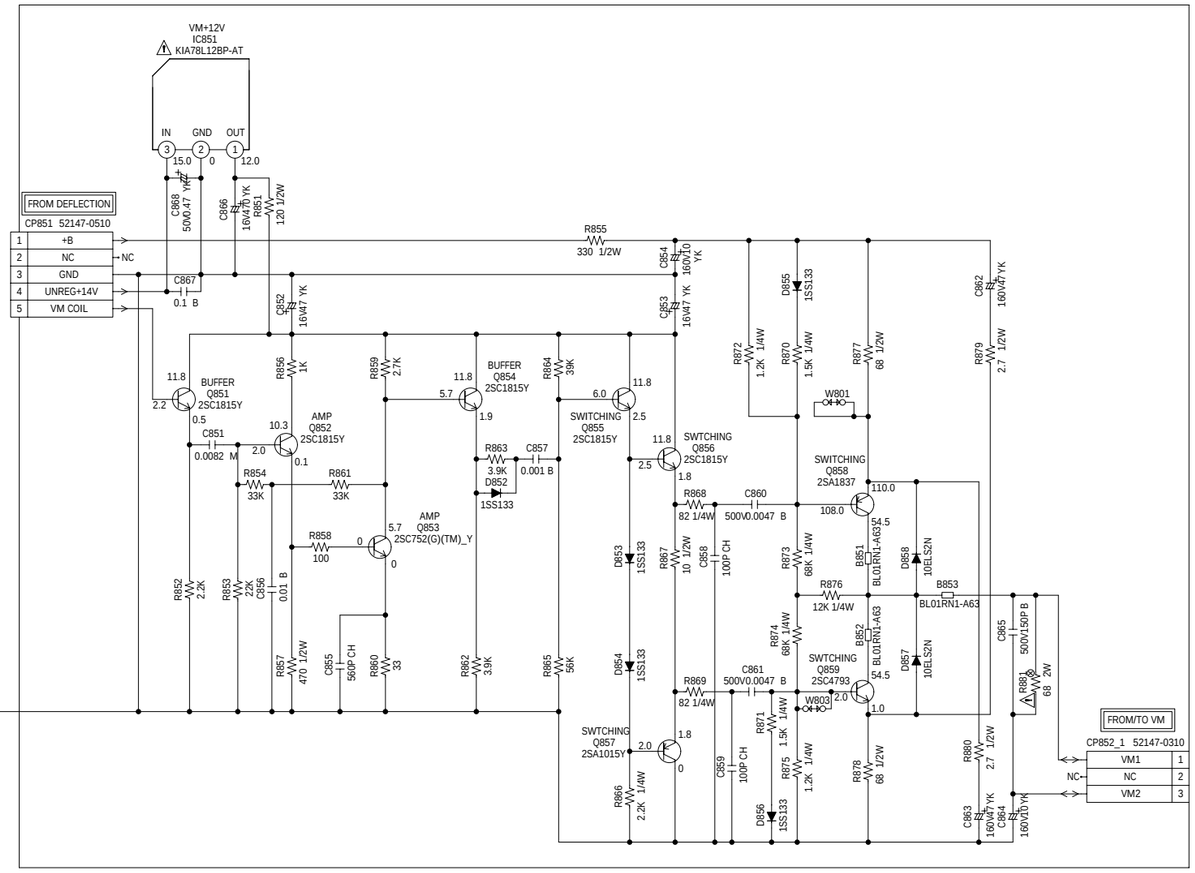
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

CRT / SVM SCHEMATIC DIAGRAM

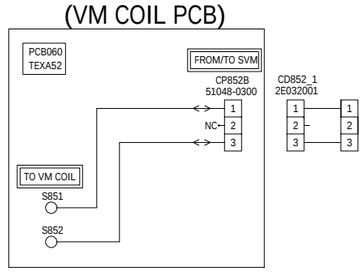
(CRT PCB)

PCB110
TCX341





(VM COIL PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

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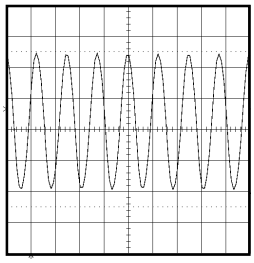
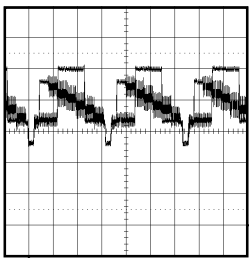
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

WAVEFORMS

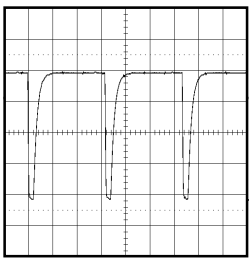
MICON/TUNER



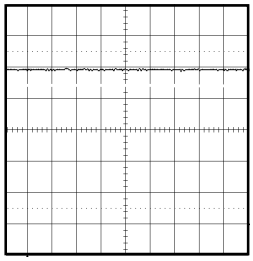
① 1V 0.1µs/div



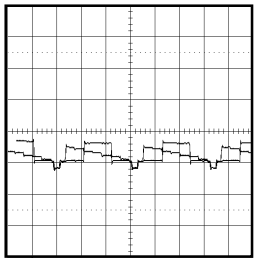
⑥ 1V 20µs/div



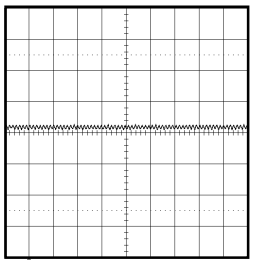
⑪ 0.5V 20µs/div



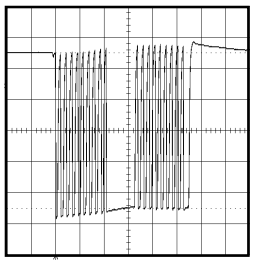
② 1V 1µs/div



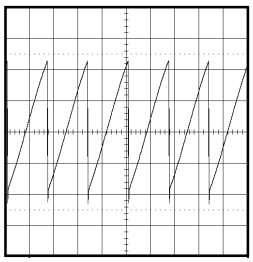
⑦ 1V 20µs/div



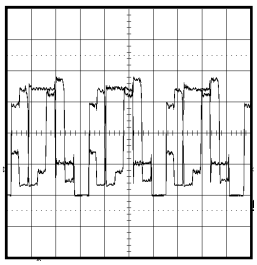
⑫ 1V 2µs/div



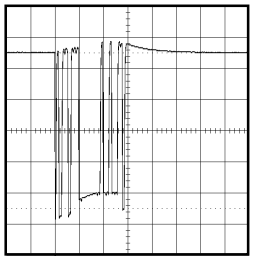
③ 1V 50µs/div



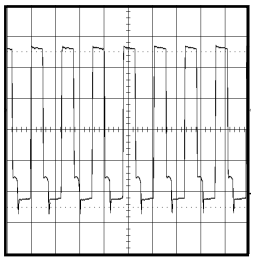
⑧ 0.5V 10ms/div



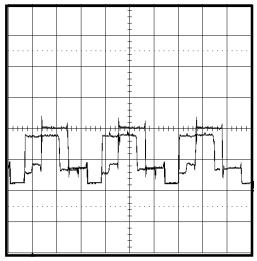
⑬ 1V 20µs/div



④ 1V 0.1ms/div

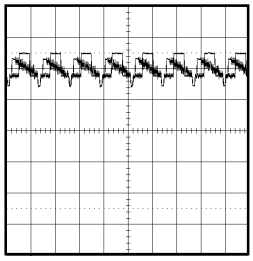


⑨ 1V 50µs/div

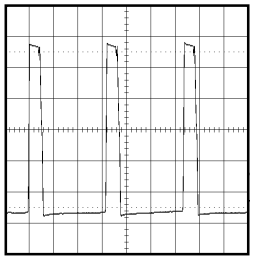


⑭ 2V 20µs/div

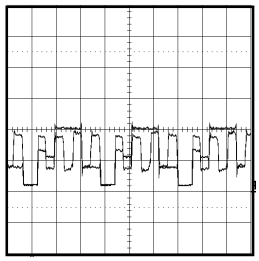
CHROMA/IF



⑤ 1V 50µs/div



⑩ 2V 20µs/div

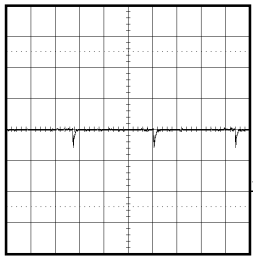


⑮ 2V 20µs/div

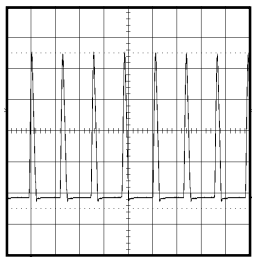
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

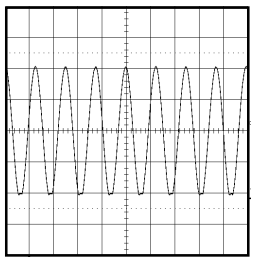
DEFLECTION



⑯ 2V 5ms/div

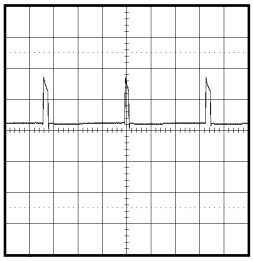


㉑ 200V 50μs/div

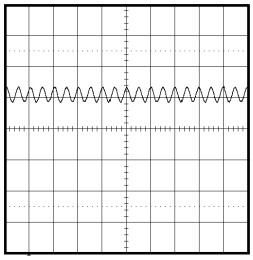


㉖ 5V 2ms/div

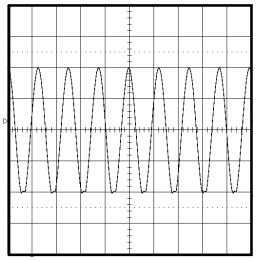
SOUND



⑰ 20V 5ms/div

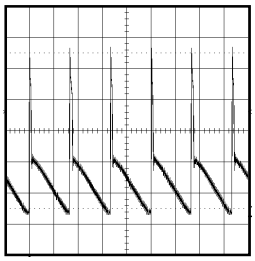


㉒ 2V 5ms/div

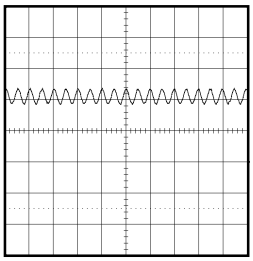


㉗ 5V 2ms/div

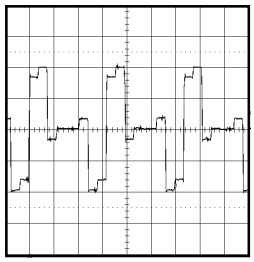
AV



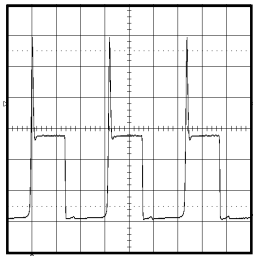
⑱ 10V 10ms/div



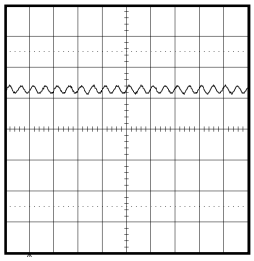
㉓ 2V 5ms/div



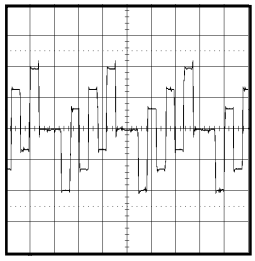
㉘ 200mV 20μs/div



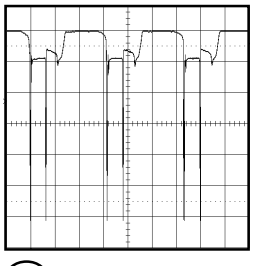
⑲ 20V 20μs/div



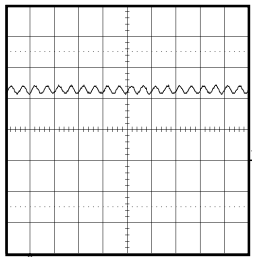
㉔ 2V 5ms/div



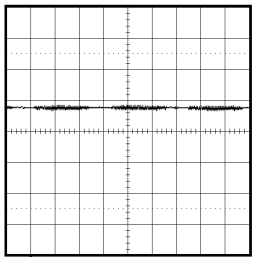
㉙ 200mV 20μs/div



⑳ 2V 20μs/div



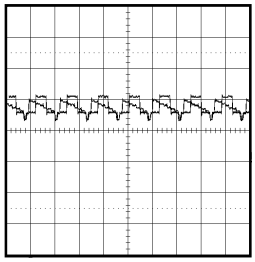
㉕ 2V 5ms/div



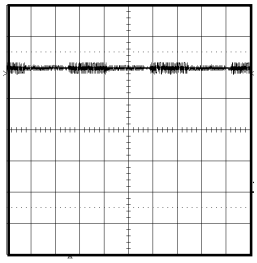
㉚ 2V 20μs/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

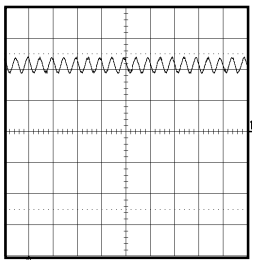


㉛ 1V 50µs/div

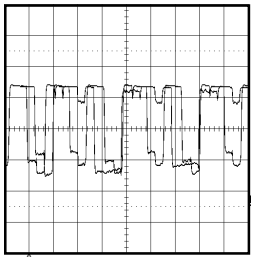


㊱ 1V 5ms/div

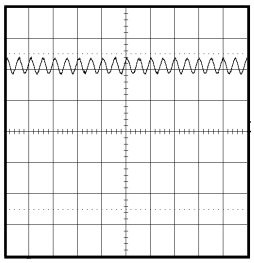
CRT



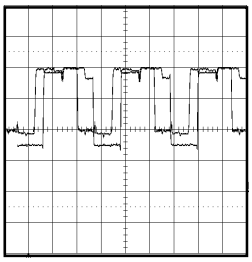
㉜ 2V 5ms/div



㊲ 50V 20µs/div

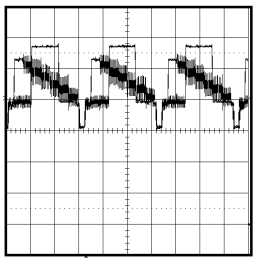


㉝ 2V 5ms/div

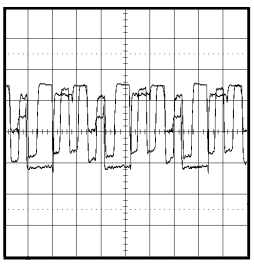


㊳ 50V 20µs/div

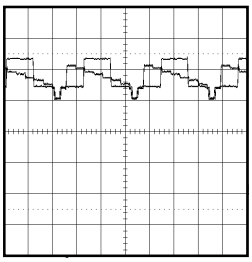
COMB FILTER



㉞ 0.5V 20µs/div



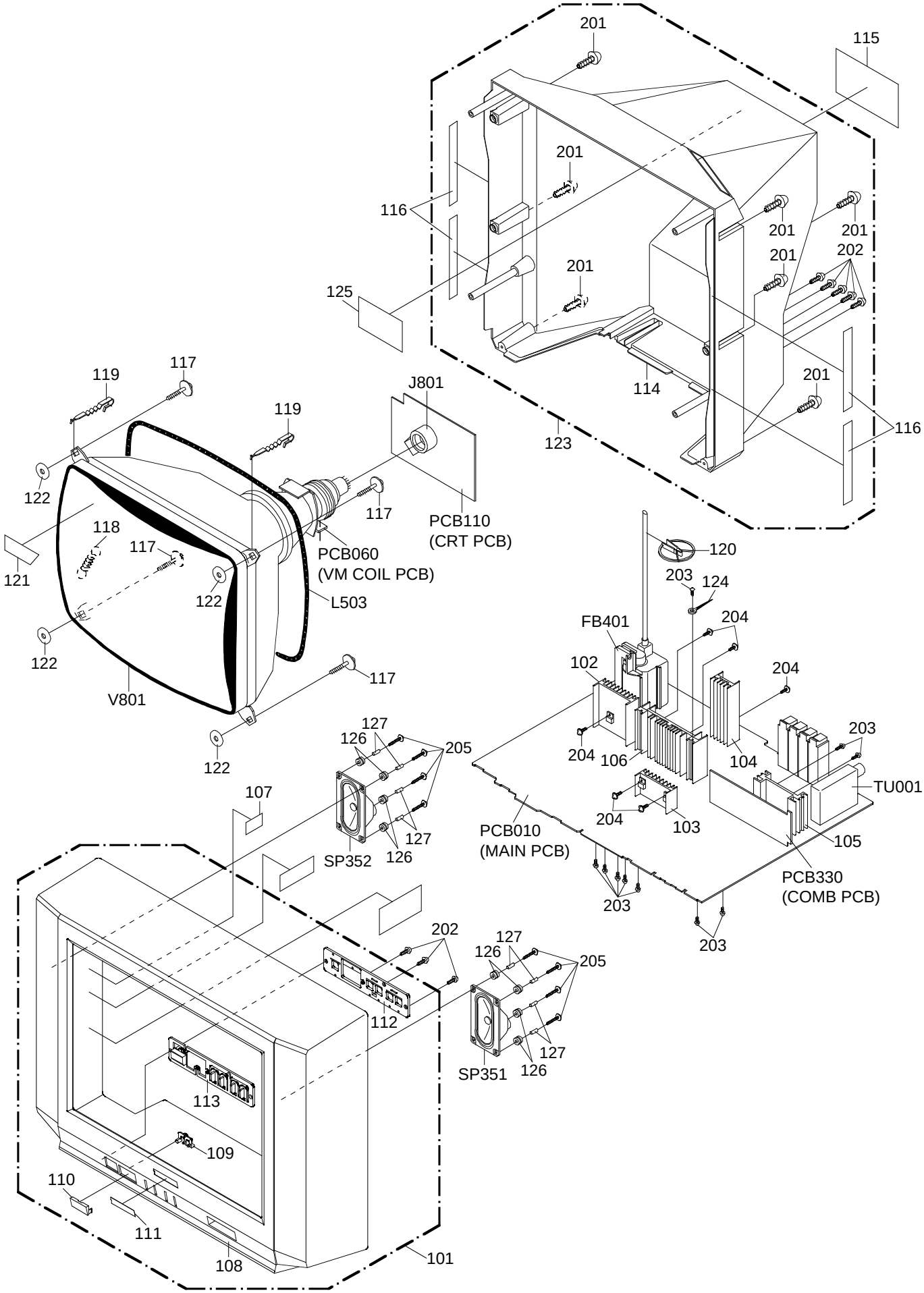
㊴ 50V 20µs/div



㉟ 1V 20µs/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

MECHANICAL EXPLODED VIEW



MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
101	AD300131	A3I707Q720	CABINET,FRONT ASSY	
102	AD300002	763WAA0181	HEAT SINK	
103	AD300003	763WAA0200	HEAT SINK	
104	AD300004	763WAA0214	HEAT SINK	
105	AD300005	763WAA0215	HEAT SINK	
106	AD300006	763WAA0216	HEAT SINK	
107	AD300132	7230006818	SHEET,CAUTION	
108	AD300008	701WPJ0997	CABINET,FRONT	
109	AD300009	713WPA0134	GUIDE,REMOCON	
110	AD300010	711WPA0147	PLATE,DISPLAY	
111	AD300011	7235490007	BADGE,BRAND	
112	AD300012	735WPA0531	BUTTON,BASE	
113	AD300444	735WPB0109	BUTTON,FRAME	
114	AD300445	702WPA0799	CABINET,BACK	
115	AD300133	7225490035	SHEET,RATING	
116	AD300134	800WQ00039	FELT,SHEET	
117	BZ710033	8111J50D05	SCREW,TAPPING(A) GW22	5x35
118	BZ710258	741WUA0001	SPRING,EARTH	
119	BZ710259	762WPA0011	HOLDER,CRT WIRE	
120	BZ710260	899HV3T000	HOLDER,ANODE WIRE	
121	AD300446	7230007251	FILM,DECORATION	
122	AD300135	769WSA0011	WASHER CRT T=0.5	
123	AD300136	A3I707Q740	CABINET,BACK ASSY	
124	BZ710039	8995034000	CORD CLIP UL CO.	
125	AD300447	7260000333	SHEET,CRT	
126	AD300448	801JRO0002	DAMPER,MD	
127	AD300449	82A2638804	SPACER	M2.6x3.8xT8
201	BZ710035	8117540A64	SCREW,TAPPING(B0) TRUSS	4x16
202	BZ710031	8110630A04	SCREW,TAP TITE(P) BRAZIER	3x10
203	BZ710019	8109630802	SCREW,TAP TITE(B) BRAZIER	3x8
204	BZ710239	8109I30A04	SCREW,TAP TITE(B) WH7	3x10
205	AD300450	8110D26A64	SCREW,TAP TITE(P) WH8	M2.6x16
---	AD300018	792WHA0293	PACKAGE,TOP	
---	AD300019	792WHA0294	PACKAGE,BOTTOM	
---	AD300020	793WCD1308	GIFT BOX	
---	AD300501	A3I707Q975	INSTRUCTION BOOK KIT	
---	AD300436	J3I70416	IMPORTANT SAFETY INSTRUCTIONS	
---	AD300138	J3I70701	INSTRUCTION BOOK	
---	AD300139	J3I70715	SERVICE STATION LIST	
---	AD300140	J3I70717	REGISTRATION CARD	
---	AD300502	J3I70725	ENVELOPE	
---	AD300503	JA4UD500	POLYBAG	

ELECTRICAL REPLACEMENT PARTS LIST

Location NO.	TSB P/N	Reference NO.		Description
			RESISTORS	
⚠ R001	BZ210008	R3X181273J	R,METAL OXIDE	27K OHM 1W
⚠ R410	AD300034	R5X2CE222J	R,CEMENT	2.2K OHM 7W
⚠ R411	AD300032	R6558AR39J	R,FUSE	0.39 OHM 2W
R416	AD300040	R3X18A2R2J	R,METAL OXIDE	2.2 OHM 2W
⚠ R418	BZ210089	R4X5T6273F	R,METAL	27K OHM 1/6W
⚠ R422	BZ210013	R4X5T4104F	R,METAL	100K OHM 1/4W
⚠ R423	AD300042	R3X18A010J	R,METAL OXIDE	1 OHM 2W
⚠ R426	AD300037	R4X5T6153F	R,METAL	15K OHM 1/6W
⚠ R431	AD300032	R6558AR39J	R,FUSE	0.39 OHM 2W
⚠ R434	AD300033	R5X2CF2R7J	R,CEMENT	2.7 OHM 10W
⚠ R435	AD300031	R801R7272J	RC	2.7K OHM 1/10W
⚠ R436	BZ210090	R4X5T6822F	R,METAL	8.2K OHM 1/6W
⚠ R438	BZ210046	R6558A1R8J	R,FUSE	1.8 OHM 2W
⚠ R439	AD300043	R3X181102J	R,METAL OXIDE	1K OHM 1W
⚠ R441	AD300036	R4X5T6562F	R,METAL	5.6K OHM 1/6W
⚠ R500	BZ210080	R0G3K2275K	RC	2.7M OHM 1/2W
⚠ R501	BZ210031	R5X2CE1R2J	R,CEMENT	1.2 OHM 7W
⚠ R505	AD300038	R3X20B473J	R,METAL	47K OHM 3W
⚠ R517	AD300035	R5X2CE010J	R,CEMENT	1 OHM 7W
⚠ R521	AD300041	R3X18A270J	R,METAL OXIDE	27 OHM 2W
⚠ R522	AD300041	R3X18A270J	R,METAL OXIDE	27 OHM 2W
⚠ R542	BZ210085	R33681R18J	R,METAL	0.18OHM 1W
⚠ R543	BZ210049	R635U2681J	R,FUSE	680 OHM 1/2W
⚠ R804	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W
⚠ R806	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W
⚠ R808	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W
R881	AD300039	R3X18A680J	R,METAL	68 OHM 2W
			CAPACITORS	
C138	AD300438	CHGTY0214M	CC	0.01 UF 16V Y
C368	AD300067	E02LF4102M	CE	1000 UF 35V
C369	AD300067	E02LF4102M	CE	1000 UF 35V
⚠ C408	BZ110032	E5EZF3102M	CE	1000 UF 25V
C412	BZ110057	E53FF56R8K	CE	6.8 UF 50V NP
⚠ C413	AD300066	E02LF4222M	CE	2200 UF 35V
C418	AD300047	P411F4224F	CMPP	0.22 UF 400V ECWF
⚠ C420	AD300046	P414F9123H	CMPP	0.012 UF 1.6KV ECWH
⚠ C421	AD300049	P3N1F5153J	CPP	0.015 UF 630V
C422	AD300047	P411F4224F	CMPP	0.22 UF 400V ECWF
⚠ C423	AD300045	P414F9222H	CMPP	0.0022UF 1.6KV ECWH
⚠ C424	AD300048	P3N1F5183J	CPP	0.018 UF 630V
C425	AD300077	C0JLYR713K	CC	0.001 UF 2KV YR
⚠ C426	AD300061	E5EZFD220M	CE	22 UF 250V
⚠ C428	BZ110041	E02LT3471M	CE	470 UF 25V
⚠ C430	AD300064	E02LT8220M	CE	22 UF 100V
⚠ C501	AD300066	E02LF4222M	CE	2200 UF 35V
⚠ C502	AD300078	C0JBB0713K	CC	0.001 UF 2KV B
⚠ C503	AD300078	C0JBB0713K	CC	0.001 UF 2KV B
⚠ C505	BZ110035	P2122B104M	CMP	0.1 UF 250V ECQUL
⚠ C506	BZ110035	P2122B104M	CMP	0.1 UF 250V ECQUL
⚠ C507	AD300062	E52SFC681M	CE	680 UF 200V
⚠ C510	BZ110018	E5EZT4101M	CE	100 UF 35V
⚠ C513	BZ110066	C034E0J13M	CC	0.001 UF 125V MX
⚠ C514	BZ110066	C034E0J13M	CC	0.001 UF 125V MX
C517	BZ110115	C0JLYR7H3K	CC	0.0022UF 2KV YR
⚠ C519	BZ110066	C034E0J13M	CC	0.001 UF 125V MX
⚠ C521	AD300060	E62NFB101M	CE	100 UF 160V
⚠ C522	BZ110066	C034E0J13M	CC	0.001 UF 125V MX
⚠ C523	AD300060	E62NFB101M	CE	100 UF 160V
⚠ C527	AD300125	E5EZF2222M	CE	2200 UF 16V
⚠ C531	BZ110081	E02LT2471M	CE	470 UF 16V
C535	BZ110115	C0JLYR7H3K	CC	0.0022UF 2KV YR
C536	AD300077	C0JLYR713K	CC	0.001 UF 2KV YR
C611	AD300439	P6M9T0474J	CMPL	0.47 UF 50V TF
C808	AD300078	C0JBB0713K	CC	0.001 UF 2KV B
C862	AD300063	E0ELFB470M	CE	47 UF 160V
C863	AD300063	E0ELFB470M	CE	47 UF 160V
			DIODES	
D001	AD300072	D94TA30013	DIODE,ZENER	HZ30-3L TD
D102	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D103	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D104	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D106	AD300412	DD7R0S3550	DIODE,SILICON	1SS355 TE-17
D107	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D108	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D109	BZ410054	0021721150	LED	SLR-342VCT32
D201	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
⚠ D401	AD300069	D97U02701B	DIODE,ZENER	MTZJ27B T-77

ELECTRICAL REPLACEMENT PARTS LIST

Location NO.	TSB P/N	Reference NO.	Description	
			DIODES	
D402	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D404	BZ410023	D97U09R11B	DIODE,ZENER	MTZJ9.1B T-77
⚠ D405	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
⚠ D406	AD300071	D97U01101B	DIODE,ZENER	MTZJ11B T-77
⚠ D407	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
⚠ D408	AD300074	D2BFRS4FS0	DIODE,SILICON	RS-4FS
⚠ D409	AD300073	D2BFRU4AM0	DIODE,SILICON	RU-4AM
⚠ D411	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
⚠ D412	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
⚠ D501	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠ D502	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠ D503	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠ D504	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠ D505	AD300076	D28F30DF60	DIODE,RECTIFIER	30DF6-FC
⚠ D506	BZ410011	D28TELS2N2	DIODE,RECTIFIER	10ELS2N-TA1B2
D507	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D508	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠ D510	AD300076	D28F30DF60	DIODE,RECTIFIER	30DF6-FC
D511	AD300075	D28TELS6N6	DIODE,RECTIFIER	10ELS6N-TA1B2
⚠ D512	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
D513	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
⚠ D514	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
D515	BZ410047	D2BTRU2YX0	DIODE,SILICON	RU2YX-V1
D516	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D517	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D518	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D519	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D520	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠ D521	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D525	BZ410020	D97U05R11B	DIODE,ZENER	MTZJ5.1B T-77
D528	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D602	BZ410066	D97U06R21B	DIODE,ZENER	MTZJ6.2B T-77
D603	BZ410066	D97U06R21B	DIODE,ZENER	MTZJ6.2B T-77
D604	BZ410066	D97U06R21B	DIODE,ZENER	MTZJ6.2B T-77
D605	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D611	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D612	BZ410066	D97U06R21B	DIODE,ZENER	MTZJ6.2B T-77
D613	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D614	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D711	BZ410066	D97U06R21B	DIODE,ZENER	MTZJ6.2B T-77
D801	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D802	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D803	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D852	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D853	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D854	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D855	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D856	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D857	BZ410011	D28TELS2N2	DIODE,RECTIFIER	10ELS2N-TA1B2
D858	BZ410011	D28TELS2N2	DIODE,RECTIFIER	10ELS2N-TA1B2
			ICS	
IC101	AD300051	I56D07054A	IC	OEC7054A
IC103	AD300050	I9UJ0T600C	IC	PST600C
IC199	AD300126	A3I707Q015	IC	S-24C08ADPA-01
IC201	AD300058	I05DC12530	IC	TB1253N
IC301	AD300055	I0QF021500	IC	NJM2150AM
IC303	BZ611034	I06DF62420	IC	M62420SP
⚠ IC353	AD300056	I0FSP52760	IC	AN5276
⚠ IC401	BZ611025	I03TD80400	IC	LA78040
⚠ IC501	BZ611036	I2BT06624G	IC	STR-G6624
⚠ IC502	BZ611033	I1KA97809A	IC	KIA7809API
⚠ IC503	BZ611015	I1KA97805A	IC	KIA7805API
IC701	AD300054	I0UD013110	IC	MM1311AD
⚠ IC851	AD300052	I1KJ98L120	IC	KIA78L12BP-AT
IC901	AD300057	I05FE90A53	IC	TC90A53F
IC902	AD300059	I01FF58290	IC	AN5829S
IC903	AD300053	I1K998L050	IC	KIA78L05BP-AT
			TRANSISTORS	
Q101	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q102	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q103	BZ510020	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146
Q105	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q107	BZ510022	TNYJJ05001	COMPOUND TRANSISTOR	DTC114TKAT146
Q109	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q201	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q202	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q203	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S

ELECTRICAL REPLACEMENT PARTS LIST

Location NO.	TSB P/N	Reference NO.	Description	
			TRANSISTORS	
Q204	AD300030	T83A028140	TRANSISTOR,SILICON	2SC2814(F3,F4)-T
Q351	BZ510022	TNYJJ05001	COMPOUND TRANSISTOR	DTC114TKAT146
Q401	BZ510034	TA5T010154	TRANSISTOR,SILICON	2SA1015Y(TPE2)
⚠ Q402	BZ510027	TC3Q026210	TRANSISTOR,SILICON	2SC2621(D,E)-RAC
Q403	BZ510034	TA5T010154	TRANSISTOR,SILICON	2SA1015Y(TPE2)
Q404	AD300027	TC30041590	TRANSISTOR,SILICON	2SC4159(D,E)
⚠ Q405	BZ510040	TDUU024990	TRANSISTOR,SILICON	2SD2499(LB0EC1)
Q406	BZ510049	TPYJD05001	COMPOUND TRANSISTOR	DTA144EKAT146
⚠ Q501	BZ510031	TD3T007340	TRANSISTOR,SILICON	2SD734(E,F)-AA
⚠ Q502	BZ410040	0002500560	PHOTO COUPLER	TLP621(D4-GR-LF2)
Q504	BZ510012	TC5T018154	TRANSISTOR,SILICON	2SC1815Y(TPE2)
⚠ Q507	BZ510012	TC5T018154	TRANSISTOR,SILICON	2SC1815Y(TPE2)
⚠ Q508	AD300028	TBWT009260	TRANSISTOR,SILICON	2SB926(S,T)-AA
Q509	BZ510020	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146
⚠ Q510	BZ510031	TD3T007340	TRANSISTOR,SILICON	2SD734(E,F)-AA
Q604	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q701	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q704	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q705	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q709	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
⚠ Q801	BZ510027	TC3Q026210	TRANSISTOR,SILICON	2SC2621(D,E)-RAC
⚠ Q802	BZ510027	TC3Q026210	TRANSISTOR,SILICON	2SC2621(D,E)-RAC
⚠ Q803	BZ510027	TC3Q026210	TRANSISTOR,SILICON	2SC2621(D,E)-RAC
⚠ Q810	AD300442	TCYT1740S0	TRANSISTOR,SILICON	2SC1740SP(R,S) TP
⚠ Q811	AD300442	TCYT1740S0	TRANSISTOR,SILICON	2SC1740SP(R,S) TP
⚠ Q812	AD300442	TCYT1740S0	TRANSISTOR,SILICON	2SC1740SP(R,S) TP
Q851	BZ510012	TC5T018154	TRANSISTOR,SILICON	2SC1815Y(TPE2)
Q852	BZ510012	TC5T018154	TRANSISTOR,SILICON	2SC1815Y(TPE2)
Q853	AD300024	TCUT00752Y	TRANSISTOR,SILICON	2SC752(G)(TM)_Y
Q854	BZ510012	TC5T018154	TRANSISTOR,SILICON	2SC1815Y(TPE2)
Q855	BZ510012	TC5T018154	TRANSISTOR,SILICON	2SC1815Y(TPE2)
Q856	BZ510012	TC5T018154	TRANSISTOR,SILICON	2SC1815Y(TPE2)
Q857	BZ510034	TA5T010154	TRANSISTOR,SILICON	2SA1015Y(TPE2)
Q858	AD300029	TAU0018370	TRANSISTOR,SILICON	2SA1837
Q859	AD300025	TCU0047930	TRANSISTOR,SILICON	2SC4793
Q901	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q903	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q904	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q905	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q906	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q907	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q908	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q909	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q910	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q911	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q912	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q913	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
			COILS &TRANSFORMERS	
L101	AD300121	021LA62R7K	COIL	2.7 UH
L201	BZ310041	02167F101J	COIL	100 UH
L202	AD300127	02161CR82M	COIL	3 0.82 UH
L203	BZ310009	021LA62R2K	COIL	2.2 UH
L204	BZ310038	021LA6120K	COIL	12 UH
L205	BZ310003	021673470K	COIL	47 UH
L301	BZ310029	021LA6470K	COIL	47 UH
L302	BZ310058	021LA6220K	COIL	22 UH
L401	AD300117	02D1000001	COIL	ELC16B501EN
L402	BZ310063	022100027A	COIL,LINEARITY	ELH5L4113
⚠ L501	AD300119	029T000097	COIL,LINE FILTER	1R5A123F28Y
⚠ L503	BZ310066	028R200024	COIL,DEGAUSS	8R200024
L505	BZ310002	021673101K	COIL	100 UH
L601	BZ310003	021673470K	COIL	47 UH
L602	BZ310002	021673101K	COIL	100 UH
L603	BZ310003	021673470K	COIL	47 UH
L604	BZ310003	021673470K	COIL	47 UH
L701	BZ310001	021673101J	COIL	100 UH
L703	BZ310003	021673470K	COIL	47 UH
L802	AD300123	021673151K	COIL	150 UH
L803	AD300123	021673151K	COIL	150 UH
L804	AD300123	021673151K	COIL	150 UH
L810	AD300118	02AXB9A971	CORE,FERRITE	ESD-R-30SD
L901	BZ310058	021LA6220K	COIL	22 UH
L903	BZ310043	021LA6150K	COIL	15 UH
L904	BZ310058	021LA6220K	COIL	22 UH
L905	BZ310043	021LA6150K	COIL	15 UH
L907	AD300122	021LA6270K	COIL	27 UH
L908	BZ310067	021LA6180K	COIL	18 UH

ELECTRICAL REPLACEMENT PARTS LIST

Location NO.	TSB P/N	Reference NO.	Description	
			COILS &TRANSFORMERS	
L909	BZ310043	021LA6150K	COIL	15 UH
L910	BZ310043	021LA6150K	COIL	15 UH
L912	BZ310043	021LA6150K	COIL	15 UH
T401	BZ310072	045013001J	TRANS,HORIZONTAL DRIVE	5013001
⚠ T501	AD300115	0481400614	TRANSFORMER,SWITCHING	81400614
			JACKS	
⚠ J351	BZ614144	0602131011	HEADPHONE JACK	HSJ2000-01-010
J701	AD300113	0602431011	JACK,RCA	JPJ4312-01-432
J702	AD300108	063Q700002	JACK	YKF51-5503
J703	AD300113	0602431011	JACK,RCA	JPJ4312-01-432
J704	AD300109	060X411015	RCA JACK	JPJ4311-011852
J705	AD300113	0602431011	JACK,RCA	JPJ4312-01-432
J710	AD300110	060G401047	RCA JACK	HTJ-032-03AY
J711	AD300111	060G401046	RCA JACK	HTJ-032-03AW
J712	AD300112	060G401039	RCA JACK	HTJ-032-03AR
⚠ J801	BZ614115	066C130017	SOCKET,CATHODE RAY	TUBECVT3275-5101
			SWITCHES	
SW101	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010
SW102	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010
SW103	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010
SW104	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010
SW105	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010
			VARIABLE RESISTORS	
VR502	BZ210068	V1163Q3BTC	VOLUME,SEMI FIXED	EVNCYAA03BQ3
			P.C.BOARD ASSEMBLIES	
PCB010	AD300128	A3I707Q01A	PCB ASS'Y	TMX481A
PCB060	AD300081	A3I704Q06A	PCB ASS'Y	TEXA52A
PCB110	AD300080	A3I704Q11A	PCB ASS'Y	TCX341A
PCB330	AD300079	A3I704Q33A	PCB ASS'Y	TEXA48A
			MISCELLANEOUS	
B501	BZ310045	024AT03481	CORE,BEADS	BL02RN1-R62T2
B502	BZ310015	024AT03482	CORE,BEADS	BL02RN2-R62T4
B504	BZ310016	024AT03655	CORE,BEADS	BL01RN1-A63T6
B505	BZ310015	024AT03482	CORE,BEADS	BL02RN2-R62T4
B851	BZ310016	024AT03655	CORE,BEADS	BL01RN1-A63T6
B852	BZ310016	024AT03655	CORE,BEADS	BL01RN1-A63T6
B853	BZ310016	024AT03655	CORE,BEADS	BL01RN1-A63T6
CD351	AD300093	06CU14411A	CORD,CONNECTOR	CU14411A
⚠ CD501	BZ614053	120R614909	CORD,AC	0R614909
CD801	AD300085	122E063701	CORD,JUMPER	2E063701
CD802	AD300084	122E075701	CORD,JUMPER	2E075701
⚠ CD803	AD300094	06CP83035A	CORD,CONNECTOR	CP83035A
CD851	AD300129	122E053701	CORD,JUMPER	2E053701
CD852	AD300086	122E032001	CORD,JUMPER	2E032001
CF201	BZ613015	1011T4R504	FILTER,CERAMIC	EFCT4R5YS5A
CF202	AD300087	1022T45R71	FILTER,SAW	SAF45MFX220ZR
CF203	BZ613016	1011T4R517	FILTER,CERAMIC	EFCT4R5MW5
CP101	BZ614135	0694260139	CONNECTOR PCB SIDE	173979-6
CP351	AD300097	069W14T299	CONNECTOR PCB SIDE	TID-X04P-Z1
⚠ CP401	AD300095	069X460029	CONNECTOR PCB SIDE	B06B-DVS-L
⚠ CP501	BZ614012	0697320039	CORD,UX CONNECTOR	THL-P03P-B1
CP502	BZ614018	069W420029	CONNECTOR PCB SIDE	TV-50P-02-A1
CP503	BZ614058	069W010010	CONNECTOR PCB SIDE	005P-2100
CP504	BZ614058	069W010010	CONNECTOR PCB SIDE	005P-2100
CP801	AD300099	069R260589	CONNECTOR PCB SIDE	52147-0610
CP802	AD300098	069R270589	CONNECTOR PCB SIDE	52147-0710
CP803	AD300096	069W330018	CONNECTOR PCB SIDE	TS-80P-03-V1
CP804	BZ614058	069W010010	CONNECTOR PCB SIDE	005P-2100
CP851	AD300100	069R250589	CONNECTOR PCB SIDE	52147-0510
CP852	AD300101	069R230589	CONNECTOR PCB SIDE	52147-0310
CP901	AD300102	069J160260	CONNECTOR PCB SIDE	6035B-06Z002-T
CP902	AD300103	069J130260	CONNECTOR PCB SIDE	6035B-03Z002-T
CD701A	AD300443	06CH244002	CORD,CONNECTOR	CH244002
CP801A	AD300105	067R006019	WIRE HOLDER	51048-0610
CP802A	AD300104	067R007019	WIRE HOLDER	51048-0710
CP851A	AD300106	067R005019	WIRE HOLDER	51048-0510
CP852B	AD300107	067R003019	WIRE HOLDER	51048-0300
EL001	BZ614044	124120301A	EYE LET	XRY20X30BD
EL002	BZ614043	124116281A	EYE LET	XRY16X28BD
⚠ F501	BZ614125	081PC6R304	FUSE	51MS063LCC
⚠ FB401	AD300116	043220050R	TRANSFORMER,FLYBACK	3220050R
FH501	BZ614005	06710T0006	HOLDER,FUSE	EYF-52BC
FH502	BZ614005	06710T0006	HOLDER,FUSE	EYF-52BC
OS101	BZ614171	077Q014003	REMOTE RECEIVER	PIC-28143SY-2
⚠ RY501	AD300114	0560V20115	RELAY	ALKS321
⚠ SP351	AD300092	070W457001	SPEAKER	MSF-2D5SB10
⚠ SP352	AD300092	070W457001	SPEAKER	MSF-2D5SB10

ELECTRICAL REPLACEMENT PARTS LIST

Location NO.	TSB P/N	Reference NO.	Description	
			MISCELLANEOUS	
⚠ TH501	AD300068	DF40B3R0Q0	DEGAUSS ELEMENT	PTBD14K2-3R0Q141
TM101	AD300091	07660DU010	TRANSMITTER	SBKMOP006A
⚠ TU001	AD300124	0145W00052	TUNER,VHF-UHF	NJH3022U268
⚠ V801	AD300089	098W200487	CRT W/DY	A51LSH196X07(O)
X101	AD300088	1002T00802	CERAMIC OSCILLATOR	CSTS0800MG03-T2
X601	BZ613004	100CT3R505	CRYSTAL	HC-49/C
RESISTOR				
		RC.....	CARBON RESISTOR	
CAPACITORS				
		CC.....	CERAMIC CAPACITOR	
		CE.....	ALUMI ELECTROLYTIC CAPACITOR	
		CP.....	POLYESTER CAPACITOR	
		CPP.....	POLYPROPYLENE CAPACITOR	
		CPL.....	PLASTIC CAPACITOR	
		CMP.....	METAL POLYESTER CAPACITOR	
		CMPL.....	METAL PLASTIC CAPACITOR	
		CMPP.....	METAL POLYPROPYLENE CAPACITOR	

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